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Index

Author/s

Mosquera-Losada MR, Ferreiro-Domínguez N, Alvarez-Lopez V, Rodriguez-Rigueiro JJ, Franco-Grandas T, Wezel A, Grard B, Schmutz U, Wigboldus S, Donhan J, Migliorini M, Canalil S, Bingol O, Santiago-Freijanes JJ

Contributors:

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Introduction

This set of policy briefs have been developed by a set of preliminary and final studies conducted by the AE4EU team along the project duration. A set of 13 policy briefs have been created ad their respective links can be seen in the web page of the project (ae4eu). The policy briefs have been conceived approaching the initial steps of the CAP (policy briefs from 1 to 4), the agroecology thinking about the transformation from an economic (policy brief 5), agroecological farming and food systems linkages (policy brief 6), the agroecological movement networking with ENAF (policy brief 7) and the deployment of the agroecology living labs (policy brief 8). Finally, a deep analysis of the current development stage of the 2023-2027 CAP, initiated by proposing a definition to help policy makers to identify agoecology (policy brief 9) across the whole CAP in an easy way that can be deployed by the policy makers at European, National, regional and local levels, trying to facilitate both the understanding and business environment facilitation of the more diffuse agroecology concept. The policy brief 10 analyses the current conditionality or rules that have to be fulfilled by the farmers to receive the direct payments, with a special focus on the first time newly launched social conditionality. The policy brief 11 analyse the role of agroecology within the list of ecoschemes provided by the European Commission, mostly associated with carbon farming practices. Finally policy briefs 12 and 13 provide the initial analysis of the CAP 2023-2027 from an agroecosystem and agroecological perspective, respectively.

The links of the policy briefs in the web page of the project are:

#1 Policy Brief - Improving Eco-Schemes in the Light Of Agroecology: Key Recommendations for the 2023-2027 Common Agricultural Policy

#2 Policy Brief - 10 Steps to Achieve the European Green Deal

#3 Policy Brief - Fostering the transformative role of agroecological research in Europe

#4 Policy Brief - Eco-Schemes in EU Member States Could Benefit from More Agroecology

#5 Policy Brief - How to Value and Fund Agroecological Transformation

#6 Policy Brief: Enhancing opportunities for agroecological transformations of farming and food systems in Europe—addressing missing links

#7 Policy Brief: European Network for Agroecological Food Systems (ENAF)

#8 Policy Brief: Establishing an effective European network of Agroecology Living Labs: Entry points from a farmland biodiversity perspective

#9 Defining agroecology from a policy perspective

#10 Conditionality and agroecology practices

#11 Agroecology and the ecoschemes from a policy perspective

#12 Agroecology and environmental rural development programme interventions

#13 Agroecology and social rural development programme interventions

All them are available in: https://www.ae4eu.eu/agroecology-in-europe/policy-briefs/

#1 Policy Brief - Improving Eco-Schemes in the Light Of Agroecology: Key Recommendations for the 2023-2027 Common Agricultural Policy

IMPROVING ECO-SCHEMES IN THE LIGHT OF AGROECOLOGY

Key recommendations for the 2023-2027 Common Agricultural Policy

Authors: Jesse Donham, Alexander Wezel,
Paola Migliorini, AE4EU

February 2022

Forward

On the 25th of June 2021, the EU finalised its negotiations for the new Common Agricultural Policy (CAP) that is set to come into power on the 1 January 2023 and run until 2027. While this CAP is being championed by its creators as a radical new framework for tackling agricultural and environmental issues, it has left many civil society organisations to wonder if it will deliver on the commitments found in other legislations such as the Farm to Fork Strategy of the EU Green Deal.

The Horizon 2020 project, Agroecology for Europe (AE4EU), aims to take part in this discussion and provide insights for policy makers and Member States in order to ensure that this new CAP is as robust as possible and delivers on its promises for change.

Integrating Eco-schemes according to agroecology

One of principal changes within the new CAP has been the inclusion of Eco-schemes – voluntary programmes linked to the first pillar which will be available to farmers with the hope to incentivize more ecological and environmentally-friendly farming practices. While agroecology holds an eminent space within this list by being listed as one of the primary recommendations, it does so within a role of just another practice to achieve a more sustainable farming system.

As stated by many before, such as Hill (1985), Gliessman (2016) and Agroecology Europe (2021), agroecology is not just the substitution of one practice for another, it is a restructuring of the entire agricultural and food system. It is not just a tool to increase efficiency, it is a paradigm shift that uses food, health and the environment as a starting point to create a system that is inherently resilient. Further, it is important to remember that agroecology consists of three major elements: a set of practices, a science and a social movement (Wezel et al., 2009, Agroecology Europe, 2020).

As Agroecology Europe (2021) has proposed earlier this year, it is important to separate practices (i.e. buffer strips, winter cover crops) and production systems (i.e. agroecology, agroforestry, organic farming) for a more cohesive integration of Eco-schemes. Production systems such as conservation agriculture, agroforestry, and extensive silvo-pastoral systems should be subsidized by basic premiums, as organic farming is. Practices that can be implemented on their own, and are not production systems themselves, should be reclassified into three separate measures, those that: increase input efficiency, substitute inputs and redesign the production system. Such categories can be further classified according to the function they fulfil within agroecosystems: soil fertility, weed management, pest and disease control, pasture management, animal welfare, biodiversity and pollinator conservation, and climate change mitigation and adaptation. A further description of what such a system would look like can be seen in the CAP policy brief 1, where each measure is represented by a different colour: efficiency (E) in orange, substitution (S) in blue, and redesign (R) in green.

Table 1: Classification of the Eco-schemes proposed by the Commission according to the logic of "efficiency – substitution – redesign" (letter and colour code) and the logic of classification of measures in relation to agroecosystem service management (columns). Each measure is represented by a different colour: efficiency (E) in orange, substitution (S) in blue, and redesign (R) in green. (source: Agroecology Europe 2021).

	MANAGEMENT OF ALL TYPES OF CROPS AND GRASSLANDS		MANAGEMENT OF ALL TYPES OF CROPS		GRASSLANDS AND LIVESTOCK		ENVIRONMENTAL MANAGEMENT		
	Soil fertility	Weed management	Pest management	Disease management	Grassland management	Animal welfare	Biodiversity conservation and restoration	Pollination conservation and enhancement	Climate mitigation and adaptation
IPM Practices									
Buffer strips with management practices and without pesticide			R				R	R	R
Mechanical weed control		S			S				
Increased use of resilient, pest-resistant crop varieties and species	R	R	R	R					R
Land lying fallow with species composition for biodiversity purpose							R	R	
Agroecological practices									
Crop rotation with leguminous crops	R	R	R	R			R	R	R
Mixed cropping - multi cropping	R	R	R	R			R	R	R
Cover crop between tree rows on permanent crops	R	R	R	R			R	R	R
Winter soil cover and catch crops above conditionality	R	R	R	R			R		R
Low input efficient grass-based livestock system	R	R			R	R	R		R
Mixed species/diverse sward of permanent grassland for biodiversity purpose			R	R	R	R	R	R	R
Improved rice cultivation to decrease methane emissions									E
Husbandry and animal welfare plans									
Providing access to pastures and increasing grazing period for grazing					R	R			
Shepherding on open spaces and between permanent crops, transhumance		R			R	R	R		R
Semi-natural habitat creation and enhancement		R	R	R			R	R	R
Establishment and maintenance of permanent grassland	R				R	R	R	R	R
Extensive use of permanent grassland	R		R		R	R	R	R	R
Animal health prevention and control plans: overall plan for reducing the risk of					R	R			
Practices increasing animal robustness, fertility, longevity and adaptability,					R	R			R
Mixed grazing (minimum 2 species)					R	R			
Improved manure management and storage	R				R				
Carbon farming practices									
Rewetting wetlands/peatlands, paludiculture							R		R
Minimum water table level during winter									R
Appropriate management of residues, i.e. seeding on residues	R						R		R
Nutrients management plan, use of innovative approaches to minimise	E								E
Precision farming									
Precision crop farming to reduce inputs (fertilisers, water, plant protection	E	E	E	E					E
Improving irrigation efficiency	E	E	E	E					E
Managing crop water demand (switching to less water intensive crops,									R
Feed additives to decrease emissions from enteric fermentation									E
Other practices									
Erosion prevention strips and wind breaks	R						R	R	R
Establishment or maintenance of terraces and strip cropping	R	R	R	R			R		
Implementation of nitrates-related measures	E				E				E

Efficiency (E)
Substitution (S)
Redesign (R)

Further, in order for Eco-schemes to truly lead to a long-term redesign of agricultural systems, it is important for them to be multi-dimensional. Policy makers should encourage the implementation of several practices at once, as a practice on its own has little strength in creating true sustainability. Rather than a menu of options farmers can choose from, packages should be constructed in a way where complexity and synergy is created on farms with many proven environmental benefits. Higher subsidies can also be given to farmers who are implementing these packages or several practices at once - Agroecology Europe has provided calculations of what this would look like (Agroecology Europe, 2021). Such packages could also include multiple tiers, with different levels of pay for different efforts, rather than flat rates (BirdLife Europe et al., 2021).

It also important for conditionality to remain rigorous, and not be weakened or included within Eco-schemes. Practices that are already common or very basic should not be rewarded. For example, a few countries are planning to pay farmers to grow cover crops during winter. Although this practice is vital for the protection of soils, there are already obligations to have soil cover during sensitive periods within conditionality. Funding should focus on demanding interventions that maintain fair rewards for farmers who want to make greater efforts to be more sustainable and provide ecosystem services. If successful funding schemes are not created, there is immense risk that low ambition schemes will sideline more worthwhile schemes which will not be attractive enough for farmers to uptake them on a large scale (BirdLife Europe et al., 2021).

Around 25% of the CAP direct payments, € 8-9 billion per year are planned to go to Eco-schemes. This public taxpayer money, along with the total €387 billion CAP budget, should pay for public goods and reward ecosystem services with proven environmental benefits, for example the carbon sequestration in agricultural soils, restoration of biodiversity farms and in agricultural landscapes, the development of ecological networks and conservation of semi-natural landscape elements (e.g. hedges, wood clumps, herbaceous strips, ponds).

Recommendations for Eco-schemes

1. Separate practices from production systems.
2. Create basic premiums for all eco-friendly agricultural production systems.
3. Create multi-dimensional Eco-schemes that encourage the implementation of multiple practices at once.
4. Ensure proportionality between the level of payment and the expected environmental benefits.
5. Maintain rigorous conditionality by not paying for what should be mandatory.
6. Public money for public goods.

Assessment of draft Eco-schemes

An assessment of the Eco-schemes shows that only
19 % of schemes are likely to deliver their environmental objectives, with 40 % needing significant improvements and 41% either concerning or completely greenwashing. Well-designed schemes are underfunded, while their less demanding counterparts remain more financially attractive (BirdLife Europe et al., 2021). This is dangerous for true environmental benefits to biodiversity, soil health, and climate mitigation and adaptation.

Further, the forementioned assessment has found many policy gaps within the proposed strategic plans including only two countries creating schemes to reduce antimicrobial use (although both schemes were deemed poor and as potential hidden subsides for intensive animal farming); only one scheme reducing herd size; only a few schemes focusing on growing feed to reduce feed import (a major solution for climate mitigation); only one scheme ceasing farming on drained peatlands (another major source of climate mitigation) and none to incentivize paludiculture; minimal support for agroforestry; and finally, the inclusion of precision farming without any rules for the reduction of fertiliser and pesticide use (BirdLife Europe et al., 2021).

Agroecology related Eco-schemes in draft national CAP strategic plans

An analysis by the AE4EU project on the inclusion of agroecology related Eco-schemes in the draft national strategic plans, shows a low number of agroecology-related policies (Table 2). While on average, countries have around three Eco-schemes with agroecological elements, with five being the highest (Poland) and zero the lowest (Belgium - Wallonia, Cyprus), there is a lot to be said for the strength of the existing Eco- schemes, which as mentioned above, are found by many civil society organisations as poor and unlikely to deliver on environmental benefits. The most popular Eco-schemes in the strategic plans are those relating to extensive grasslands management, use of cover/catch crops and organic farming. The least popular, with no schemes found in any countries, are “mixed cropping - multi cropping” and “improved rice cultivation to decrease methane emissions” (although Spain does mention rice production in one of their schemes, the scope remains unclear). Multidimensional Eco-schemes are the most likely to deliver, nevertheless they are found in only five countries - Czech Republic, Estonia, Latvia, Slovakia and the Netherlands. Interestingly, while the Netherlands has only chosen to include a single Eco-scheme within its strategic plan, there are nevertheless four different agroecological elements found in the scheme.

Table 2: Agroecology related Eco-schemes in draft national CAP strategic plans (2023-2027), state of February 2022

Country	Number of Eco-schemes	Eco-scheme name
Austria	3	Cover crop between permanent crops Low intensity grass-based livestock system Winter soil cover and catch crops
Belgium (Flanders)	3	Crop rotation with leguminous crops Low intensity grass-based livestock system Organic practices and standards
Belgium (Wallonia)	0	
Bulgaria	4	Winter soil cover and catch crops Cover crop between permanent crops Permanent grassland for biodiversity Organic practices and standards
Croatia	3	Permanent grassland for biodiversity Winter soil cover and catch crops Crop rotation with leguminous crops
Czech Republic	2	Winter soil cover and catch crops Permanent grassland for biodiversity
Cyprus	0	
Denmark	3	Winter soil cover and catch crops Permanent grassland for biodiversity Organic practices and standards
Estonia	2	Crop rotation with leguminous crops Organic practices and standards
Finland	4	Low intensity grass-based livestock system Permanent grassland for biodiversity Crop rotation with leguminous crops Winter soil cover and catch crops
France	4	Permanent grassland for biodiversity Organic practices and standards Crop rotation with leguminous crops Cover crop between permanent crops
Germany	3	Low intensity grass-based livestock system Permanent grassland for biodiversity Crop rotation with leguminous crops
Greece	3	Use of crops/plant varieties more resilient to climate change Permanent grassland for biodiversity Organic practices and standards
Hungary	3	Permanent grassland for biodiversity Low intensity grass-based livestock system Organic practices and standards
Ireland	2	Low intensity grass-based livestock system Permanent grassland for biodiversity
Italy	3	Permanent grassland for biodiversity Cover crop between permanent crops Crop rotation with leguminous crops
Latvia	4	Winter soil cover and catch crops Cover crop between permanent crops Crop rotation with leguminous crops Low intensity grass-based livestock system
Netherlands	4	Permanent grassland for biodiversity Organic practices and standards Crop rotation with leguminous crops Winter soil cover and catch crops
Poland	5	Permanent grassland for biodiversity Organic practices and standards Crop rotation with leguminous crops Winter soil cover and catch crops Low intensity grass-based livestock system
Portugal	2	Permanent grassland for biodiversity Organic practices and standards
Slovakia	1	Permanent grassland for biodiversity
Slovenia	3	Winter soil cover and catch crops Permanent grassland for biodiversity Cover crop between permanent crops
Spain	4	Crop rotation with leguminous crops Cover crop between permanent crops Low intensity grass-based livestock system Permanent grassland for biodiversity
Sweden	3	Organic practices and standards Permanent grassland for biodiversity Winter soil cover and catch crops

The way forward

It is clear that many Eco-schemes have not been created with enough coherence, some barely going beyond basic practices and conditionality, and unlikely to sufficiently deliver on needed ecosystem services. What are needed are multi-dimensional Eco-schemes with robust funding, clear targets and proven benefits in order to improve the sustainability of farming in Europe.

The formal review process by the European Commission of the national CAP strategic plans is taking place in early 2022 and marks a key milestone to pave the way towards a consistent agricultural policy that is beneficial to the climate, biodiversity and health. The Commission should encourage and support Member States to restructure their draft national strategic plans in order to set clear objectives and roadmaps that are in line with other major EU legislations and agroecology.

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Images

Ducks in agroforestry image by Heather Birnie, Parc Carreg, farm in Wales
Pigs in agroforestry image by Samantha Makepeace, Northern Native, upland farm in the North East of England

Authors

Jesse Donham - Agroecology Europe,
Belgium Alexandar Wezel - ISARA,
France
Paola Migliorini - University of Gastronomic Sciences, Italy

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#2 Policy Brief - 10 Steps to Achieve the European Green Deal

AE4EU

AGROECOLOGY FOR EUROPE

10 STEPS TO ACHIEVE THEEUROPEAN GREEN DEAL

Forward

The European Green Deal is a monumental step in achieving a greener and more sustainable Europe, filled with promising targets which aim to culminate in no net emissions of greenhouse gases by 2050 and economic growth decoupled from resource use. It establishes great potential for a fairer economy, the revitalisation of rural areas and sustainability. Yet, the roadmap on how to actualise such targets has yet to be realised.

This policy brief provides a roadmap, by giving recommendations for 10 concrete steps that can be taken to achieve the European Green Deal through agroecology, especially the Biodiversity and Farm to Fork Strategies. It will focus on many of the technical aspects, as well as on research, social responsibilities and responsible governance. Each step is to be considered as a whole, rather than individually, as many steps require the other in order to create true transformation.

Agroecology is a holistic concept that embraces a diversity of interpretations, intentions and realities, depending on the country and its context, history, stakeholders and socio-political environment. Its aim is to restructure the food system in a way that maximises ecological processes to attain sustainability – encompassing agricultural practices, science and social movements (Wezel etal., 2009). While it is dynamic and ever-changing, it holds at its heart sustainable agricultural practices that include: the use of local resources, enhancing soil health and life (improving organic matter and biological activity), increased use of legumes for nitrogen fixing qualities, agroecological infrastructures (habitats for biodiversity conservation and beneficial species for pest control), recycling biomass (optimising and closing nutrient cycles), reducing dependence on external synthetic inputs, enhancing diversity in crops and livestock, and increasing resilience against climate change. These all strengthen synergy between the various elements of the system that transform our local, regional, national and trans-national food systems on a large scale– economically, politically and socially.

1 Strongly decrease synthetic pesticides and fertilisers

Farm to Fork Target: Reduce by 50 % the use and risk of chemical pesticides by 2030.

Agroecology uses natural cycles and ecological processes instead of relying on chemicals to achieve sustainable food. Rather than purchasing expensive inputs, it aims for a lower input agriculture that uses local resources, increases soil life and maintains nutrient flows at the farm and territorial level (e.g. through legumes and manure for nitrogen fixing qualities). By creating diverse and long crop rotations, intercropping, using a diversity of crops and keeping constant soil cover, it creates a synergetic system that halts the pest and weed reproduction cycles and makes pesticides (insecticides, herbicides, fungicides) obsolete. It simultaneously minimises resource losses (water, nutrients, biomass). The focus in such a system is transformed from maximum yields to optimum yields, while also diminishing dependence on global trade.

Farm to Fork Target: Reduce fertiliser use by at least 20 % by 2030.

The reduction of pesticides is often automatically linked with the reduction of synthetic fertiliser use since plant varieties whose great yield is only possible with growth regulators and pesticides are no longer used. This can be achieved through the fertilisation that occurs through symbiotic fixation from leguminous crops and through nitrogen transfers from livestock, especially ruminants. These two systems should not be seen individually but in symbiosis as both are important tools toensure human and environmental health (e.g. eutrophication, emissions), and keeps us within planetary boundaries.

2 Increase mixed crop-livestock systems

Farm to Fork Target: Reduce nutrient losses by at least 50 % while ensuring no deterioration on soil fertility

One of the most important components of agroecological transformation is returning fertility to soils and valuing the innumerable services of soil organisms. Within agroecology, animals are vital to soil fertility, especially when livestock and crop production is reconnected in mixed crop-livestock systems. Such integrated systems either grow animals and crops on a single farm, or cooperate amongst neighbouring farms for the exchange of hay, straw and manure, creating regional autonomy. This is optimal for the reduction of fertilisers and nutrient losses, as animal manure can increase soil fertility on the spot or through nitrogen transfers, which additionally reduces animal waste, transport emissions related to feed and imported deforestation (which hurts global biodiversity and increases GHG emissions). The integration of crops and animals on a single farm, while sharing space at the same time or in rotation, creates deep interactions which provide environmental services and social benefits (e.g. economic resilience). Further, a regional system founded on a mosaic of diverse landscape structures creates an equilibrium for both crops and livestock needs.

Enhance animal health and extensively managelivestock

Target: Reduce sales of antimicrobials for farmed animals and in aquaculture by 50 % by 2030.

3

Within intensive conventional agriculture, animals are often kept indoors inconditions that not only increase diseases but cause severe animal welfare issues related to discomfort, pain, fear, distress, and abnormal behaviours. Extensively managed, grass-based livestock systems on the other hand, halt almost all of these concerns simply by animals living outside, giving them access to healthier feed provisioning and conditions. When a farmer includes rotational grazing and crop- livestock rotations, intestinal parasites can be managed through the disruption of the host-pathogen cycles and herbal leys can be incorporated to regulate animal health without veterinary drugs. This change would also revitalise and maintain grasslands, increase biodiversity within grasslands, and should include diverse animal breedsthat easily digest woody fodder, are more suited to local realities (i.e. climate, terrain),and are 'dual purpose' for both meat and milk. Such systems would prioritise breeds for their performance criteria from quantity of milk or meat, to their ability to adapt to a changing climate. Further, the mineral makeup of milk and meat from such systems also changes to create healthier diets with Omega-3 content of milk doubled when animals are feeding on grass which is critical for cardiovascular health in humans (IDDRI, 2018). Lastly, extensively managed systems give priority to crops directly consumed by humans as they are no longer in competition with feed, whichis often imported from great distances with high GHG emissions, creating a more autonomous Europe.

Restore and enlarge permanent grasslands

Biodiversity Strategy Target: Strictly protect at least a third of the EU's protected areas - representing 10% of the EU land and 10% of EU sea - including all remaining primary and old-growth forests as well as other carbon rich ecosystems, such as peatlands, grasslands, wetlands, mangroves and seagrass meadows.

4

The restoration of Europe's grasslands is not only important for their immense carbon sink qualities (can store up to 30% of the world's carbon) but they are also the heart of European biodiversity (up to 79 species in just 1 m2 in Europe)(IDDRI, 2018). Therefore, addressing biodiversity loss cannot be done without a focus on grasslands, which often include important agroecological infrastructure (hedges, wood clumps, grass strips, ponds, ditches) which provide food, shelter, and ecological and territorial connectivity. For biodiversity purposes it is important to focus on extensively managed permanent grassland to provide a continuity of landscape and habitats for reproduction, as tilled or fertilised grasslands lose species richness. Further, the conservation of diversified grasslands implies the support of the livestock systems which ensure their vitality, keeping traditional diets in a way that does not impact the planet.

5 Return trees to agricultural landscapes

Biodiversity Strategy Target: Plant 3 billion trees by 2030.

Increasing tree cover is important for many reasons, including to combat climate change, increase biodiversity and for animal welfare, but how and where those trees are planted is of utmost importance. If trees are planted in commercial monocultural forestry systems, the benefits derived from them, beyond carbon sequestration, are very limited. Similarly, large-scale tree planting in grassland areas where diversity is already very high would be counterproductive. Therefore, it is important that trees are planted to support and regenerate already functioning agroecosystems. The European Green Deal could use agroforestry to accomplish such a target, as agroforestry is a multifunctional land use approach that delivers environmental, social and economic benefits that can be used at any scale, by all farmers, including small-scale farmers. The benefits of agroecological agroforestry systems are many: they control pests; improve soil fertility, water quality, and biodiversity; reduce erosion; sequester carbon; capture excess nitrogen; create buffers in storms and droughts; ensure ecological corridors and generate diversified incomes. Most importantly, agroforestry provides both economic and environmental resilience where disturbances and extreme weather events will continue to cause instability in coming years.

6 Diversify the types and number of crops grown on a single farm

Green Deal Target: The EU's goals are to reduce the environmental and climate footprint of the EU food system and strengthen its resilience, ensure food security in the face of climate change and biodiversity loss and lead a global transition towards competitive sustainability from farm to fork and tapping into new opportunities.

Increasing the diversity and number of crops grown on a single farm is necessary in order to create environmental and economic resilience to a changing climate which incorporates the use of annual, perennial and permanent crops. This includes variety in space and time, using a mix of practices that include intercropping, diversified rotations, agroforestry, and crop diversification at the farm scale. Such complexities can be used to provide economic (e.g. multiple incomes in case of pest outbreaks) and environmental tools (e.g. drought resistant varieties, resilience to climate change). It can also support healthy, diverse and culturally appropriate diets which respect food traditions. New crops, rarely used crop species, and locally adapted breeds and crops are important pillars for climate adaptation. It is important to mention that this does not mean the production of genetically modified seeds which seek to create a single variety of each crop that relies on synthetic inputs, instead of increasing system diversity. Further, the ability to save a seed, which is not possible with GMO crops, creates not only autonomy for the farmer, it is also a vital tool for climate mitigation as season after season, specific attributes are bred into the seed naturally, with the needs of that particular region. The heart of crop diversity is also the ability for communities to engage in food sovereignty and seed exchange, which preserves intergenerational land practices and cultural meaning.

Increase diversity of habitats

Biodiversity Strategy Target: Bring back at least 10% of agricultural area under high diversity landscape features by 2030.

7

Increased diversity in plant and animal species ensures the sustainability and well functioning of that particular ecosystem, including the pollinators agriculture and human diets strongly rely on. Yet diversity is not only important within fauna and flora, but also within habitats. Within agroecology, mosaics of different landscapes in different forms and sizes, that serve both humans and non-human members of the environment, are fundamental. This includes forests, arable land, and grassland with agroecological infrastructure of hedges, woody clumps, grass strips, ponds, and ditches all within close proximity. These habitats and their functional biodiversity regulate any insect or plant from becoming a pest, providing essential ecosystem services for agricultural production, as well as ecological corridors.

Increase the adoption of organic farming

Farm to Fork Target: Achieve 25 % of total farmland under organic farming by 2030.

8

Organic farming, in its most rigorous form, includes many agroecological practices forclosed loop, ecologically sound systems that provide dignified incomes for farmers, as well as the preservation of family farming, which is responsible for over half of allfood production in Europe (Eurostat, 2020). Organic farming calls for alternatives topesticides, veterinary products, non-synthetic crop fertilisers, as well as higher animal welfare. Although organic farming is not (yet) focused on the more social aspects that are demanded in agroecological food systems, it has a focus onenvironmental degradation and human health that can help preserve natural resources, encourage biodiversity both inside the farm and in surrounding areas, sequester carbon, ensure soil health and eliminate many of the emissions and toxicrepercussions of synthetic pesticides and fertilisers.

Increase regional research on best practices for allaspects of the food system including for climate, soil,land management, and crop and animal diversity

Biodiversity Strategy Target: 10 billion euros under Horizon Europe [are] to be invested in R&I related to food, bioeconomy, natural resources, agriculture, fisheries,aquaculture and environment.

9

Research and innovation are key drivers in the agroecological transition to sustainable and healthy food systems. In order to ensure resilience under a changing climate, and to become less dependent on fossil fuel based global trade, it is important to invest in research that can provide farmers with state of the art data thatis specific to their climates, terrains and realities. One of agroecology's fundamental pillars is focusing on the local and regional scale, creating strategies that are diverse

in each farm and region, rather than a one-size-fits-all solution. Such research can go beyond the academic halls of Europe's universities and include the establishment of networks of living labs and EU partnerships that focus on agroecology, food and soil. An enabling framework to bring these ambitions to life will need to bridge many sectors such as finance, capacity, research, innovation and technology in order to provide systems-based research that moves away from quick fixes and silver-bullet solutions. Such research needs to be disseminated and paired with knowledge exchange and training that is farmer to farmer led. The AE4EU project has taken the first steps on many of these tasks, first by mapping agroecology across European countries to give an overview of the different realities of agroecology thus far, encompassing subjects such as living labs, science and research, education and training, social movements, as well as in practice. Through this initial mapping it was found that in order to improve the strength of the living lab concept, an important tool for agroecological transformation, it is important for each region to provide their own diffusion of the term and adjust it according to local realities. Next, the project will create a hub, a virtual space where individuals from all related professions can gather information and share knowledge, practices and experiences. The hub aims to be a space of connection for farmers, researchers, students, chefs, professors, citizens,social movements, NGO's and policy makers.

Promote participatory and multi-stakeholderapproaches in knowledge generation

Green Deal Target: Reduce net emissions of greenhouse gases by at least 55% by 2030.

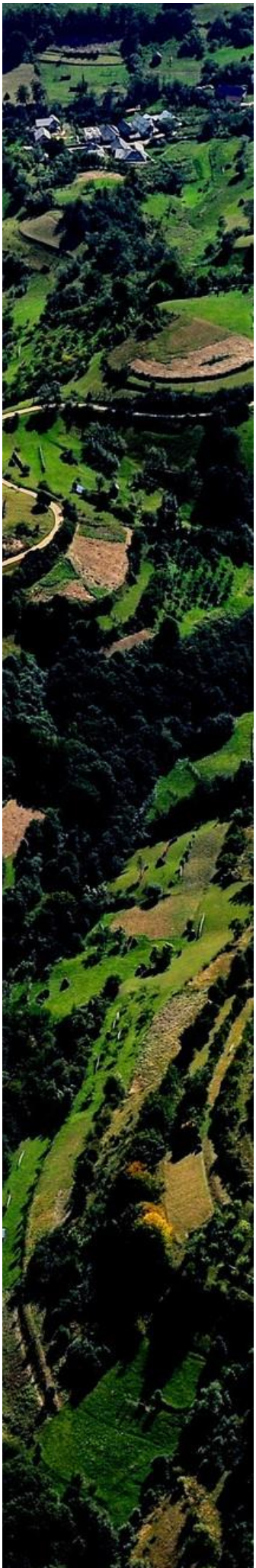
The EU has pledged to reduce greenhouse gas emissions and become climate neutral by 2050. This requires research and innovation by a variety of stakeholders in a participatory and co-creative process that is people-led, inclusive, transdisciplinary and holistic. AE4EU is engaging in such a process through the creation of a network of networks that aims to complement, support and link existing groups, initiatives and programmes that are working towards the development of agroecology. This network is led by 30 different organisations, mostly outside of the Horizon 2020 project, and will continue to exist once the project has ended. By enabling participation across all sectors, innovative solutions can be created that are rooted in equality and a just transition. This includes relinquishing power imbalances in the food system by treating uniformly all diverse ways of knowing, including traditional knowledge, lived experience, case studies and observations, to complement scientific data (Global Alliance for the Future of Food, 2021). In order to achieve climate neutrality, it is important to redesign our food system completely in a way that goes beyond production and focuses on socio-economic aspects such as responsible governance and re-establishing connections between growers and those who eat. Further, it is vital that short and long term considerations are included in all future decision-making for thoughtful transformation which addresses systemic issues and creates system-wide benefits.

10 Steps to Achieve the European Green Deal

1. Strongly decrease synthetic pesticides and fertilisers
2. Increase mixed crop-livestock systems
3. Enhance animal health and extensively manage livestock
4. Restore and enlarge permanent grasslands
5. Return trees to agricultural landscapes
6. Diversify the types and number of crops grown on a single farm.
7. Increase diversity of habitats
8. Increase the adoption of organic farming
9. Increase research on best practices at the local and regional scale for all aspects of the food system including for climate, soil,land management, and crop and animal diversity
10. Promote participatory and multi-stakeholder approaches inknowledge generation

The way forward

The European Commission has done significant work to create strategies that will enable a just and sustainable transition for Europe through the Green Deal. Yet, the lack of frameworks to guide such a shift in agricultural production especially, has meant that the path has not yet gained critical momentum. AE4EU has created such a framework that although concrete, canbe redefined to the local scale. This framework is characterisedby a mosaic of different systems, landscapes and practices that are rooted in regionality and respect cultural traditions. Each member state can continue this work by creating their own policies tailored to their country's context and conditions which are guided by these 10 steps, while keeping in mind HLPE's 13principles of agroecology, both in their state policies and through through their CAP Strategic Plans, especially through the eco-schemes, which AE4EU has written another policy brief with even more specific guidance.



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Images

Images 1 & 2 by Alfred Grand, Grand Farm, AustriaImage 3 by Ulrich Schmutz
Image 4 by Dr. Peter Lengyel

Authors

Jesse Donham - Agroecology Europe, BelgiumAlexander Wezel - ISARA, France
AE4EU - www.ae4eu.eu
https://twitter.com/ae4eu_H2020

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#3 Policy Brief - Fostering the transformative role of agroecological research in Europe

AE4EU

AGROECOLOGY FOR EUROPE

FOSTERING THE TRANSFORMATIVE ROLE OF AGROECOLOGICAL RESEARCH IN EUROPE

Policy Brief,

AE4EU

November 3, 2022

Forward

Agroecology is a holistic concept that embraces a diversity of interpretations, intentions and realities, depending on the country and its context, history, stakeholders and sociopolitical environment. Its aim is to restructure the food system in a way that maximises ecological processes to attain sustainability – encompassing agricultural practices, science and social movements (Gliessman 2007, Wezel et al. 2009).

Agroecology also represents a collective-action model to challenge and contrast the dominant agri-food system while creating sustainable alternatives built on place-based food interactions, food sovereignty, local knowledge and identity, and social justice (Levidow et al., 2014; Altieri and Toledo, 2011). Nevertheless, agroecology is also adopted by actors who promote conventional and agro-industrial agriculture (Holt-Gimenez and Altieri 2013) through sustainable intensification approaches geared towards increasing productivity. These two visions (*transformative vs conformative*) create a very different role for agroecology, with varied outcomes and socio-technical dynamics, including how science is conceived and articulated.

Thus, amongst the broad range of topics identified in European agroecological research (Wezel et al., 2018), some approaches are more in line with the dominant agri-food regime, while others can better integrate the participation of different actors and promote territorial development with a wider transformative role. Such analytical distinctions are necessary in order to set up appropriate agendas fostering the transformative role of agroecological research in Europe. This policy brief aims to provide research-based policy recommendations for policy makers that are responsible for the design and funding of research programmes related to sustainable agriculture, as well as agroecology. These are based on the results of the research carried out within the AE4EU project on European agroecological research projects and funding programmes.

Approach

The research was undertaken as a desk-based activity in order to collect information on research projects and funding programmers which deal with agroecology in Europe, principally at the European (within the Horizon framework which is funded by the European Union) and transnational (co-designed and co-funded by Member States with the participation of European Union) levels. Only projects where agroecology was explicitly mentioned or exemplified at least the third level (system redesign) of Gliessman's framework for classifying food system change, were considered (Gliessman, 2015). Relevant key-informants (e.g., national funding agencies) for each European country also provided information on agroecological projects and programmes at the country level (designed and funded nationally).

Further, three different surveys were conducted and sent to:

i) the coordinators of the identified research projects to learn more about their projects' features and their implementation of agroecological elements;

ii) the leaders of the identified funding research programmes to understand how agroecology is perceived by the programme designers, as well as how these programmes promote agri-food transformation through agroecology in Europe and the countries in question;

iii) any researcher involved in agroecology in order to gain a better understanding of the potential opportunities and obstacles for agroecological research.

All the data collected was integrated into a database. The information obtained through the surveys was further analysed to draw a comprehensive picture of the state of the art of the implementation of agroecological research in Europe, as well as to identify the needs for future cross collaboration between various countries and their networks.

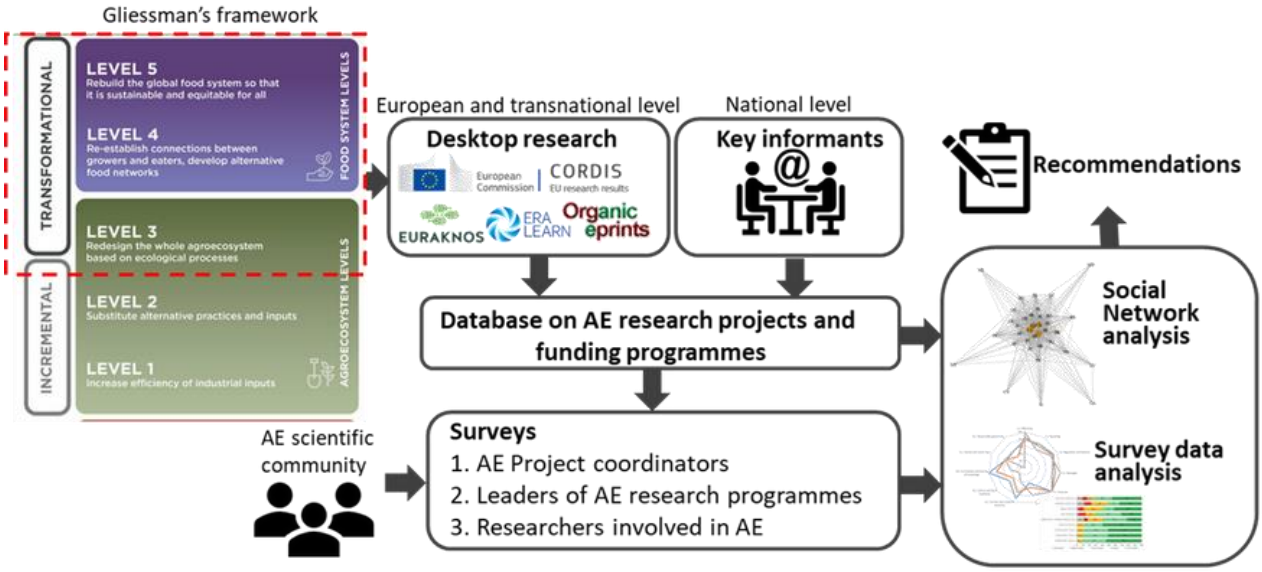

Figure 1: Methodological framework implemented. AE= Agroecology

Focal features of agroecological research inEurope

Agroecological research was found to predominantly focus on the transformation of the agri-food system, rather than on mere progress in efficiency. France, Germany, Italy, the Netherlands, Portugal, Spain, and the United Kingdom were found to be the most active countries engaged in agroecological research, as well as in transnational research collaborations. On the other hand, countries such as Malta, Moldova, and Ukraine were found to be less involved in this type of research.

The surveys showed that researchers, projects, and funding programmes all primarily focussed on improving efficiency (level 1 of Gliessman's framework), strengthening synergies (level 3), developing local economies (level 4), and the co-creation and sharing of knowledge (level 4) to support agri-food transformation through agroecology in Europe. Issues related to resilience (level 3), and the social and governance aspects (level 5) were the most uncommon. Further, the surveys confirmed that the actors most involved in agroecological research were researchers, farmers and their associations, cooperatives, and advisors. Only a few examples were found of limited participation by upstream and downstream value chain stakeholders, such as consumers.

Transdisciplinary approaches based on the interaction with non-academic actors in the co-creation of knowledge along the different phases of the research were primarily addressed by European projects, while transnational and national projects showed lower degrees of interaction, where actors were just informed or consulted. Living labs (LLs) are also becoming increasingly relevant. LLs are defined as "user- centred, open innovation ecosystems based on systematic user co-creation approach, integrating research and innovation processes in real life communities and settings." LLs, used as a means to strengthen co-innovation with non-academic actors and increase the impact of the research, were present in approximatively 50% of the European and the national projects, and only inabout 20% of the transnational ones.

Most of the Research Infrastructures (RIs), which are "facilities, resources and services that are used by the research and innovation community to conduct research and foster innovation in their fields," that were used and developed in the research remained available after the end of the projects (89% of cases). Nevertheless, among these cases, only 41% of them consisted of data that was collected and elaborated within the project, and then shared and made available to the scientific community for future research.

An increased project duration was considered the most important change needed in funding and research programmes by both researchers and programmes leaders. In addition, researchers strongly urged the introduction of more flexibility and less bureaucracy in budget and partnership management in order to enable a dynamic and functional interaction with non-academic partners in projects implementation.

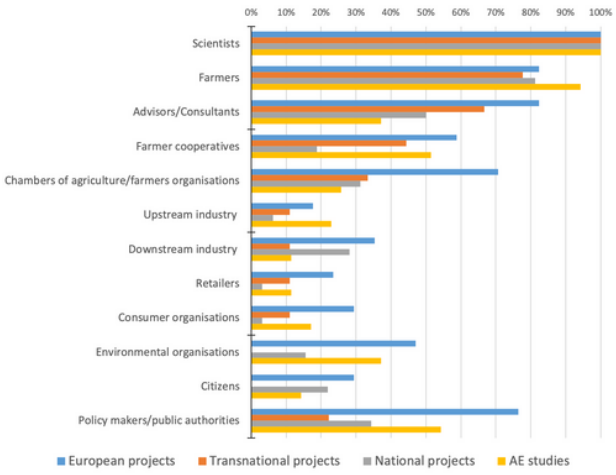

Figure 2: Actors in the Food System

Recommendations

1. Establish research programmes that consider the entire agri-food system and its actors, not only on the agronomic field and farming scales.
2. Strengthen research cooperation and networks at the European scale by lowering the barriers that hinder the connection and participation of the currently less involved countries.
3. Promote research programmes addressing, at least, level 3 (redesign) of Gliessman's framework, and especially those that go beyond this and include the social and governance aspects of level 4 and 5. On the other hand, diminish research programmes addressing only level 1 (efficiency) and 2 (substitution).
4. Design research programmes that strengthen transdisciplinary research, and explicitly demand the implementation of transdisciplinary designs and processes.
5. Enhance the involvement of a greater number of actors from the entire agri-food system, in particular those who have been less represented thus far, such as upstream and downstream value chain actors, and the non-economic actors of the food system (i.e., citizens).
6. Identify important elements and traits of agroecological Living Labsto truly guarantee the implementation of transdisciplinary approaches.
7. Promote appropriate policies regarding scientific data to guarantee data sharing and reuse within the scientific community (i.e., rewards, mandatory data sharing agreements).
8. Introduce institutional and procedural innovation to guarantee higher flexibility in the implementation of research projects, especially within budget and partnership management
9. Increase the duration of projects that are dealing with agroecology.
10. Frame research programmes in a way that does not allow small projects whose results might be too simplified, as well as very largeones that cannot be efficiently managed.

The way forward

The results and science-based recommendations provided in this policy brief aim to steer the actions of policy makers responsible for the design and funding of research programmes related to agroecology, in order to fortify its transformative role for the future of agriculture and sustainable food systems.

Indeed, today more than anytime in the past, European and transnational research programmes and their funding schemes, can encourage a transformative paradigm due to new calls and partnerships which are now being launched and designed explicitly for agroecology within the new Horizon Europe framework.

This larger, strengthened, and harmonized European perspective on agroecology can also support and drive the agroecological vision of the national funding programmes of various European countries.

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Images

- Image 1 by Stefano Canali
- Images 2, 3, & 4 by Canva

Authors

Stefano Canali (CREA-AA), Corrado Ciaccia (CREA-AA), Luca Colombo (FIRAB), JessicaDonham (AEEU), Baptiste Grard (ISARA), Ileana Iocola (CREA-AA), Stefania Maurino (CREA-AA), & Alexander Wezel (ISARA)

More information about the H2020-Agroecology for Europe project can be found at:www.ae4eu.eu, www.twitter.com/ae4eu_H2020, or www.youtube.com/channel/ UCOsUVqM8tOhE28Gr2xcp2_w

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#4 Policy Brief - Eco-Schemes in EU Member States Could Benefit from More Agroecology

ECO-SCHEMES IN EU MEMBER STATES COULD BENEFIT FROM MORE AGROECOLOGY

Authors: Charan Krishna, Jesse Donham, Alexander Wezel

AE4EU

April 19, 2023

Forward

The new Common Agricultural Policy (CAP) entered into force at the beginning of 2023, whichincludes the new form of direct payment schemes for environmental, climate and animal welfare. While it is mandatory for all Member States to create these eco-schemes in their CAP strategic plans, it remains a voluntary measure for farmers. The EU has recommended that 25% of each member state's direct payment budget be spent on such schemes, which will be completely financed by EU funding under the 1st pillar and will not require co-financing from member states(Lampkin et al., 2020).

Direct payments have the potential to indicate agenuine way of implementing the principle 'public money for public goods', and since they represent a considerable part of a farmer's income, this could motivate them to adopt more sustainable practices. Further, this intervention could contribute significantly to EU Green Deal targets, and be a key step to transitioning to sustainable food systems.

This policy brief will analyse each member state's strategic plan to determine which eco-schemes they have adopted and then identify which practices are truly agroecological and represent real progress to reach EU Green Deal targets.

The policy context

In order to design their eco-schemes, each EU member state can choose from the agricultural practices defined by the European Commission (Directorate- General for Agriculture and Rural Development, 2021). There are no restrictions in the selection of agricultural practices but they need to meet the following conditions:

1. They should cover activities related to climate, environment, animal welfare and antimicrobial resistance;
2. They shall be defined on the basis of the needs and priorities identified at national/regional levels;
3. Their level of ambition has to go beyond the requirements and obligations established under the baseline (including conditionality);
4. They shall contribute to reaching the EU Green Deal targets.

Agroecology, which is recommended among other production systems and practices, is a holistic approach to food production that combines ecological principles with social and economic considerations in order to improve the sustainability and resilience of agricultural systems (Gliessman, 2007; Wezel 2009). There are nine specific practices proposed by European Commission (EC) which are considered to be following agroecological principles (HLPE 2019):

- Crop rotation with leguminous crops
- Mixed cropping - multi cropping
- Cover crop between tree rows on permanent crops- orchards, vineyards, olive trees - above conditionality
- Winter soil cover and catch crops aboveconditionality
- Low intensity grass-based livestock
- system Use of crops/plant varieties more resilient toclimate change
- Mixed species/diverse sward of permanent grassland for biodiversity purpose (pollination, birds, game feedstocks)
- Improved rice cultivation to decrease
- methane emissions (e.g. alternate wet and dry techniques)Practices and standards as set under organic farming rules

An agricultural practice from the above list is henceforth referred as agroecological practice (AEP). If an eco-scheme adopts one of the AEPs mentioned inthe EC list, it is grouped under AEP. Eco-schemes, thatare not clearly associated with a specific AEP, are categorised into either of following two types:

- Other AEP group: If an eco-scheme adopts more than one proposed AEP, where it cannot be decided which AEP is the prevailing one, or adopts an agroecological practice that is not listed as agroecological in the EC's list (Wezel et al. 2014).
- Non-AEP group: If an eco-scheme does not include any agroecological practice or if the eco-scheme cannot be attributed clearly.

Diversity of eco-schemes in EU member states

After months of discussions and significant processesof restructuring, the 161 eco-schemes designed and submitted by the 27 member states were approved by the EC. No restrictions were placed on member stateson the number of eco-schemes that they had to design,hence the range adopted is diverse. For example, while Lithuania created 16 eco-schemes, countries such as Hungary, Ireland and The Netherlands have only oneeco-scheme.

Nevertheless, the countries that designed only one scheme made it multi-dimensional and dynamic, including many sets of practices with unique paymentmodels. Further, its important to note that the number of eco-schemes is not the most important determinant,as scale, funding and effective implementation can be much more relevant.

Although the EC did not explicitly mention the need for member states to adopt agroecological practices (AEP), all the member states except Cyprus have included at least one AEP in one or more of their eco-schemes, accounting for more than 65% of the total eco-schemes (109). Among this total, 53 eco-schemes have been clearly associated with one of the AEP listed by EC, while the others have been categorised by the authors as represented within Other-AEP group (58) and Non-AEP group (50). Figure 1 shows the number of eco-schemes per member state. Further, although many eco- scheme names provide clear intentions as to which set of practices are considered, only three member states (HU, LV, ES) have mentioned the term agroecology or agro-ecology directly in their eco-scheme names.

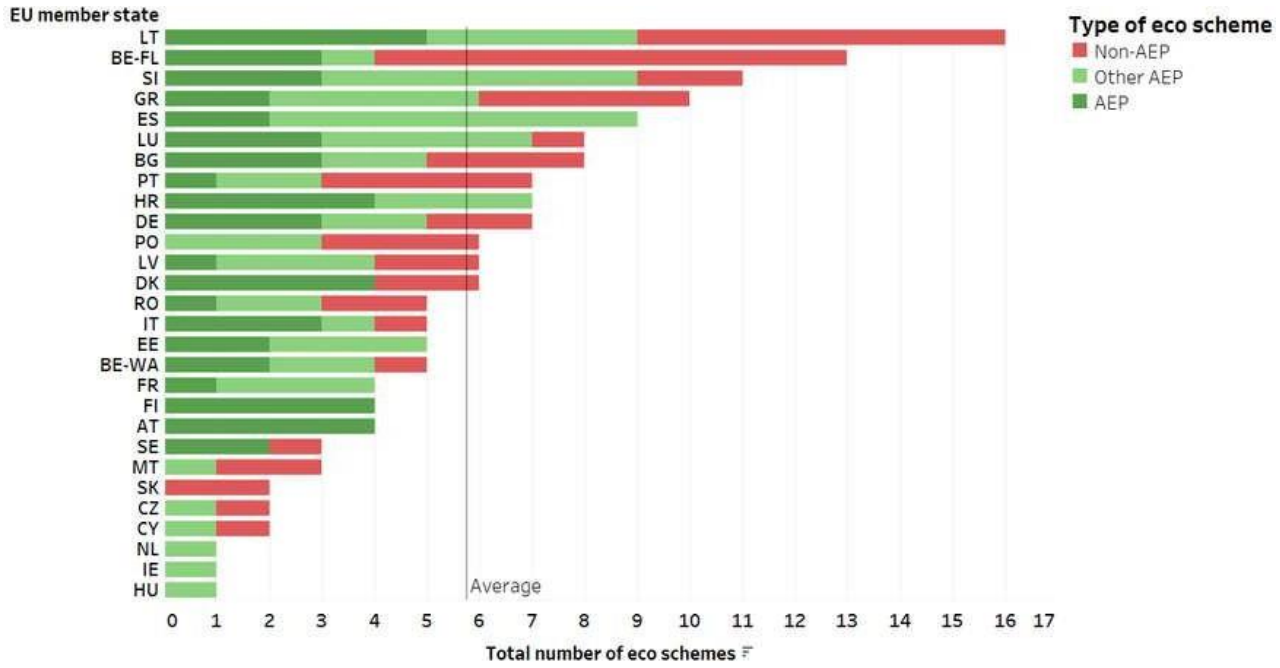

Figure 1: Number of eco-schemes adopted by the EU member states, categorized under type of eco-scheme.

Agroecological practices in eco-schemes

Among the EU member states, 19 countries (including both regions of Belgium) have adopted at least one eco-scheme that is associated with an AEP. The list of EU countries and the AEP adopted by them are shown in Figure 2. The most favoured AEPs by member states (AT, BE-FL, BE-WA, BG, DE, ES, HR, IE, LU and SI) are *Low intensity grass-based livestock system* and *Practices and standards as set under organic farming rules*, whereas eco-schemes that incentivise farmers to practice climate-resilient crops or plant varieties was explicitly adopted by Greece alone. Further, *Improved rice cultivation to decrease methane emissions* was not implemented by any country.

Eleven eco-schemes, from 10 countries (BE-FL, BG, DK, EE, FR, GR, LV, LT, PT, SE), with 2 eco-schemes from Lithuania, have been identified under the category of AEP - *Practices and standards as set under organic farming rules*. Organic farming is mentioned directly in the eco-scheme name by all of these countries except for France, who mention environmental certification in their scheme name. Five member states (BE-FL, HR, EE, IT, LT) have introduced temporal diversification of crops through AEP - *Crop rotation with leguminous crops* in their eco-schemes. All of these member states, except for Latvia, have made it mandatory to include leguminous crops within their crop rotation. Whereas, spatial diversification of crops through AEP- *Mixed cropping - multi cropping* is encouraged by 6 member states (BG, HR, DK, FI, DE, LU). The main drivers that led these states to adopt the temporal or spatial diversity related AEPs re climate change (adaptation and mitigation) and the need to improve biodiversity (particularly for pollinators). On the other hand, the adoption of AEP - *Cover crop between tree rows on permanent crops - orchards,*

vineyards, olive trees - above conditionality (AT, IT, LT, RO) seems to have been motivated by the protection of ecosystem services such ascontrolling soil erosion and encouraging pollinator species. Italy, for example, has created two such schemes under this category ('Pollinator-specific measures' and 'Weeding of tree crops'). Another AEP that focuses on covering soil with vegetation is *Winter soil cover and catch crops above conditionality*, which will be put into action in 7 countries (AT, BE- WA, DK, FI, LT, SI, SE). However, Austria has taken this a step further by dedicating two schemes to this purpose - "Greening of arable land - intercropping/catch crops" and "Greening of arable land - evergreen system".

Eco-schemes related to permanent grassland, with a hope to enhance biodiversity, are designed by 4 member states (DK, FI, DE, LU). Among these countries, only Finland has adopted two schemes for this AEP - *Mixed species/diverse sward of permanent grassland for biodiversity purpose*. Regarding reduction of livestock density in grazing areas, eight countries (AT, BE-WA, BE-FL, BG, HR, DE, LU, SI, ES) will be encouraging farmers to execute AEP- *Low intensity grass- based livestock system*. Croatia, Slovenia and Spain each have two schemes under this category. These eco-schemes are usually promoted in terms of "extensive management" of grassland and often limit stocking rates. Stocking rates relate to livestock density and the percentage of time spent on pastures. Finally, while some member states have mentioned having climate-resilient crops or practices that are climate-friendly as an option within an eco-scheme with another stated scope, Greece is the sole country to introduce a scheme specific to AEP- *Use of crops/plant varieties more resilient to climate change*.

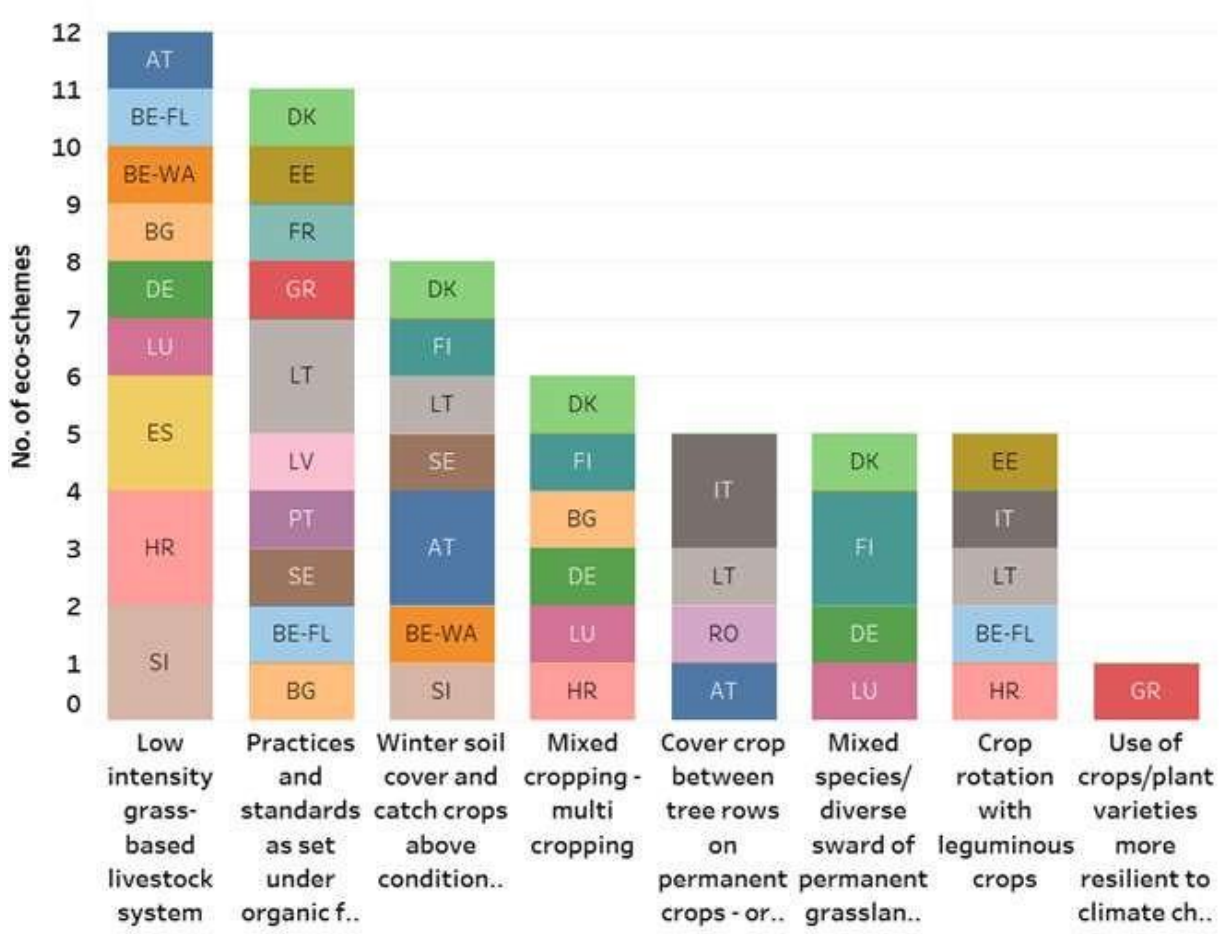

Figure 2: AEP adopted in eco-schemes by EU member states.

Other AEP in eco-schemes

Some eco-schemes do not focus directly on a specific AEP, however they appear to include practices that are closely related to them. For example, a member state may include an eco-scheme on crop rotations but they do not mention thenecessity of 'leguminous plants' and thus cannot be categorised as an EC listed AEP - *crop rotation with leguminous plants*. Another example, is when countries support the use of mixed plant species for diversity purpose on arable land rather than grassland, making them unable to be grouped under AEP: *Mixed species/diverse sward of permanent grassland for biodiversity purpose*. Such eco-schemes are classified under 'Other AEP'.

Additionally, many eco-schemes mention more than one AEP, without a single AEP standing out as the prevailing one and therefore also classified under 'Other AEP'. For instance, CZ, HU, IE, and NL designed an eco-scheme with a set of practices, which include more than one AEP. Another example is Spain, who mentions two systems in one scheme 'Carbon farming and agroecology: rotations and no-tillage on irrigated cropland'. This eco-scheme is therefore associated both with AEP - *crop rotation with leguminous plants* and another non-AEP EC listed eco-scheme conservation agriculture (under carbon farming). The Latvian eco-scheme 'Support for environmentally and climate- friendly agricultural practices' provides support for adopting either 'crop diversification' or 'soil cover during the winter period'. These practices are directly associated with the AEP - *Mixed cropping - multi cropping or Winter soilcover and catch crops above conditionality*.

The final category is for the schemes that were chosen by member states that are not suggested by the EC as relating to agroecology, that actually are (Wezel et al. 2014), such as the management of landscape features, agroforestry or biological pest control.

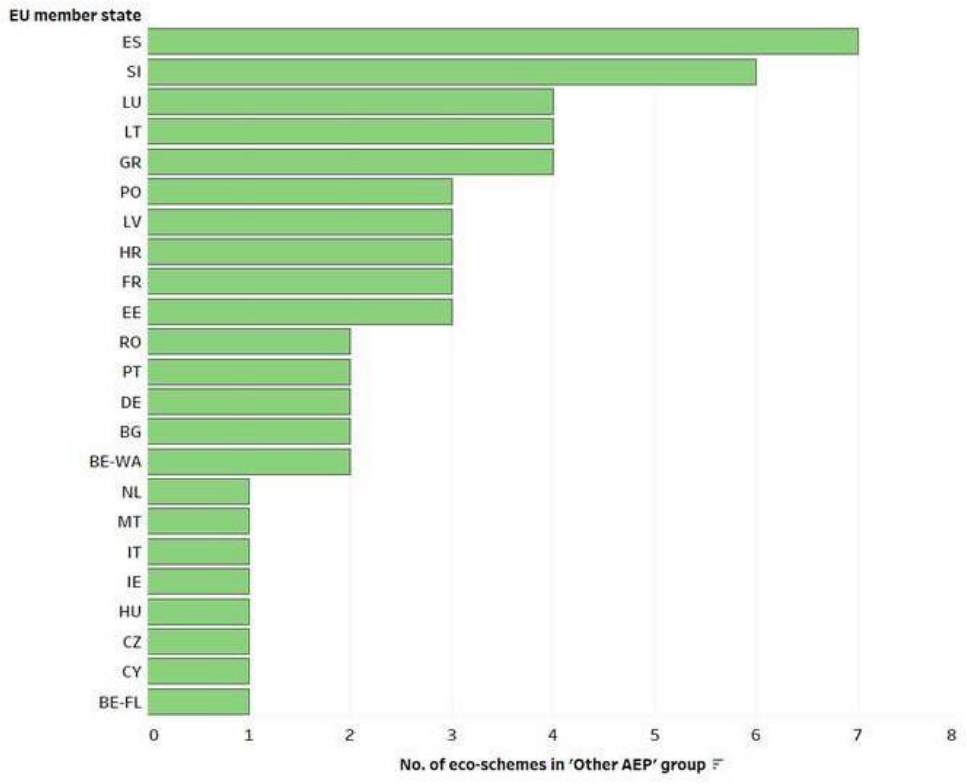

Figure 3: Other AEP adopted in eco-schemes by EU member states.

Non-AEP in eco-schemes

The eco-schemes which do not fall under AEP or Other AEP, are placed in the Non-AE group. It is important to mention that while these practices were not determined as agroecological, it does not mean that they do not include agroecological elements, but it remains unclear what the true practices and scope of the scheme are. Alternatively, there are practices that are environmentally beneficial but that never the less do not relate to agroecology.

The non-AEP or production systems that were preferred are: Precision farming (BE-FL, CZ, SE), Carbon farming (BE-FL), practices beneficial for soil (BE-FL, BG, GR, MT, PT), practices related to GHG emissions (BE-FL, PT), Integrated Pest Management practices (BE-FL), and Husbandry and animal welfare plans (IT, LU, PO, RO). The practices listed by the EC as 'Other recommended practices' were also adopted by a few countries. Belgium-Flanders, for example, has designed an eco-scheme that adopts practices related to improving nutrient management by creating a 'Soil Passport' for the management of soil at the farm level. Portugal has introduced an eco-scheme for the 'Retention of water on permanent grasslands' that focuses on protecting water resources. While many member states have focused on reducing or banning the use of phyto-pharmaceutical products in their eco-scheme descriptions, some of them (BE-WA, BG, DE, GR, LV, LT, LU) have directly mentioned in the eco- scheme name the focus on reducing chemical pesticides.

Recommendations

1. Multi-dimensionality should be added to the design of all eco-schemes in order to encourage the implementation of multiple practices at once. This will create a holistic approach to farm systems rather than focusing on individual components of a system.
2. Since one of the stated goals for the creation of eco-schemes is to implement climate-friendly practices and approaches, a strong emphasis could be given on the use of climate-resilient crop varieties, and more clarity could be created in what practices are specifically defined as climate-friendly.
3. Some eco-schemes should be given a baseline incentive and on top of this, a premium for a more holistic implementation of all measures and practices.
4. Proportionality should be ensured between the level of payment and the expected environmental benefits.
5. More result-oriented measures should be included within eco-schemes to strengthen positive results, while still allowing flexibility to farmers in order for them to manage their own strategies.
6. The amount of subsidy received should be based on the complexity needed to implement certain management practices. Less demanding counterparts should not be more financially attractive than well-designed eco-schemes.
7. Maintain rigorous conditionality by not paying for what should be mandatory.
8. There has been a huge range of interpretations from each member state when deciding how eco-schemes should be created therefore, some basic guidelines for designing eco-schemes would be beneficial in the future.

The way forward

Overall, due to their design flexibility, the approved eco-schemes arevery diverse in terms of farming practices adopted and type of payment mechanisms, such as introducing points-based system to meet climate goals. Nevertheless, it remains clear that many eco- schemes have not been created with robust funding, clear targets orproven benefits, and risk to fall short of further Green Deal goals andnot deliver environmental benefits.

When reviewing eco-schemes after the initial phase of implementation, it is vital that countries create clear objectives androadmaps that are in line with other major EU legislations and agroecology, and to choose to go beyond the vague qualities of some current schemes.

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Authors

Charan Krishna - ISARA, France
Jesse Donham - Agroecology Europe, BelgiumAlexander Wezel - ISARA, France

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#5 Policy Brief – How to value and fund agroecological transformation

HOW TO VALUE AND FUND AGROECOLOGICAL TRANSFORMATION

AE4EU

April 28, 2023

Forward

Our current food system cannot continue as it has. Soils, rivers and the atmosphere are polluted, biodiversity and insects are declining rapidly due to continued use of agricultural inputs, while a third of all food produced is wasted. In addition there are serious issues with lack of 'animal welfare' (lack of daylight, not free-range), and 'farmer welfare' (long hours, low social status).

Agroecology aims to comprehensively transform food and farming systems, in all dimensions, from production to distribution and consumption, as well as governance. The aim is to achieve greater environmental and societal benefits, while reversing the negative effects caused by existing food systems. Yet an agroecological transformation requires 'valuing' agroecology and makingavailable investments that strengthen innovative agroecological approaches, support new markets and help food system actors break free from current lock-ins. Therefore, funding agroecology is a fundamental step to enable the necessary transition.

Thus, AE4EU has created a snapshot of agroecological funding. Quantitative data was collected via European online statistic platforms, whereas qualitative data was generated through questionnaires and interviews with stakeholders directly involved in practicing, funding, and implementing programmes on agroecology in various countries. The qualitative data provides key information for understanding the context, barriers and opportunities, as well as the material realities of agroecological funding from a grassroots perspective.

EU administered funding inresearch frameworks

The CORDIS and COST databases were searched for agroecology-related keywords (see Table 1) to identify projects that were awarded funding between 1995-2020 (COST Actions) and between 2014-2020 (Horizon 2020). A closer look at the specifics of each project on CORDIS indicates that the use of the term 'agroecology' may be limited to the environmental dimension of agriculture and food systems, with the socio-economic and policy dimensions being addressed in projects using terminology linked to territorial food systems. It is thus likely that 'agroecology' is used in European research projects to denote field- and farm-level practices rather than encompass the entirety of the food system as in its more comprehensive definitions. The amount of funding made available for each keyword family is found in Table 2.

It needs to be noted that in many cases, projects do not actually use the term 'agroecology', yet nonetheless come up in search queries using the keyword 'agroecology', due to CORDIS-internal classifications. Conversely, some projects which use the term 'agroecology' do not necessarily address agroecological transformation. This is a key data constraint that points towards the need to analyse research funding in greater depth.

Keyword families	Including the related search terms	No. of Projects
Organic food & farming	Organic horticulture; organic livestock; biodynamic	59
Agroecology	Agroecological farming; peasant agroecology	95
Agroforestry	Silvopasture; silvoarable	16
Territorial food systems	Food justice; CSAs; food sovereignty; rural development	49
Regenerative farming	Permaculture; regenerative agriculture; soil health	5
TOTAL		**224**

Table 1: Projects corresponding to each of the five word families in Horizon 2020 projects.

Analysis of policy implementation at EU level and different EU countries and CAP strategies

When analysing the COST-Actions database, results show that in the early years of the 1995-2020 period none of the 5 word-families were used, not even the word 'organic'. The first project dedicated exclusively to 'organic', and with the word in the title, is BioGreenhouse (2012-2016). However, results also show that COST provides more support to agroecology-relevant concepts than Horizon 2020. In the future, promising projects that were funded through COST could be invited to develop RIAs (Research and Innovation Actions) and IAs (Innovation Actions) within Horizon Europe.

Within both Horizon 2020 and COST, it is interesting to note that projects specifically addressing problems within certified organic farming systems are rare (4%), despite the fact that 'organic' is often mentioned (48%), especially alongside the need to address issues in both farming systems (organic and conventional). Nevertheless, the use of the word 'organic' as well as the use of the word 'agroecology' have over time increased.

EU Horizon 2020 period	Total Project Budget (€ million)	Organic	Agroecology	Agroforestry	Territories, Food systems, Rural	Regenerative, Permaculture		Organic specific
H2020 2014-15	€ 80.5	€ 37.5	€ 0.0	€ 22.5	€ 31.0	€ 0.0		€ 0.0
H2020 2016-17	€ 170.0	€ 109.0	€ 24.0	€ 67.0	€ 43.0	€ 10.0		€ 14.0
H2020 2018-20	€ 131.0	€ 126.0	€ 32.0	€ 33.0	€ 3.0	€ 0.0		€ 10.0
Total		€ 272.5	€ 56.0	€ 122.5	€ 77.0	€ 10.0		€ 24.0
H2020 2014-15		41%	0%	25%	34%	0%		0%
H2020 2016-17		41%	9%	25%	16%	4%		5%
H2020 2018-20		62%	16%	16%	1%	0%		5%
Total		**48%**	**10%**	**22%**	**14%**	**2%**		**4%**

Table 2. Horizon 2020 funding in 2014-2015, 2016-2017, and 2018-2020, with the 5 word families and funding totals.

National funding–Good practices

The study also investigated national funding opportunities in various countries. Some good practice examples are presented and discussed below:

Czech Republic: Within the Liberec region, the equivalent of 25,000 Euros (€) have been set aside from the regional public budget since 2021 to improve current farming practices. What makes this funding scheme interesting is that unlike the long, bureaucratic process usually present in schemes, farmers can access the money in less than two months by filling out a very simple application form which is only two pages long. Further, the selection process is very transparent, with a point system and a score appearing as the application is being filled in. This scheme is accessible to small-scale farmers, making it very important assuch farmers are not able to access funds coming from the national budget.

Italy: At the Italian national level, the Ministry of Agriculture issues a call each year to fund any school canteen that provides organic and locally produced foods. Further, since October 2021 there has been a regional three year plan for Bio-districts in Lazio to expand organic agriculture, reduce the use of pesticides and engage in a territorial approach to food.

Poland: Within the Podkarpacki region another important scheme has been implemented in the past 5 years that supports farmers who engage in grazing with 50€/ha/year. In order for farmers to access the funds they must attend a training course, which in 2021 included 3 days of discussions on agroforestry, organic

production, biodiversity and the economics of production. This scheme has been successful because it also provides an easy entry for farmers as the paperwork is done by an intermediate foundation.

Portugal: In Portugal the government has enacted a nationwide public funding scheme that discriminates for family farms (small to medium sized farms that use family labour for more than 50% of their work). The articulation of the law is transversal, involving ten ministries, which demonstrates to society the importance of farmers to the nation.

Romania: In Transylvania, multiple funding schemes exist that support agroecology. Within the Sancraiu municipality a scheme exists thatprovides support to protect the commons-pasture lands managed collectively between the municipality and small-scale cattle farmers with the common objective to maintain high nature value farms and ensure rigorous management in extensive cow herding. In the Hosman municipality on the other hand, CAP funds are directed to maintain the presence of small-scale farmers. Through the high-nature-value subsidy schemes, such farmers receive additional benefits for keeping their input low, while maintaining pastures and meadows.

Spain: In the Valencia region, 78 million euros were allocated to an ecological and organic plan for the 2016-2020 period with the objective to promote local and ecological agricultural production, with a special focus on family agriculture. The specific budgetary lines include the promotion of conscious, responsible and ecological consumption; organic production; the commercialisation and transformation of organic food; Valencian agroecological knowledge; as well as the improvement of governance and transparency in the sector.

Barriers and opportunities on the ground

Results from the survey (questionnaire and interviews) were revealing of important barriers and opportunities for funding an agroecological transformation of food systems. 70 % of respondents belonged to farmer groups, while the remaining 30 % were researchers or individuals from the national ministries of agriculture.

While agri-environment measures, including the new CAP eco-schemes, are seen by many respondents as potentially supportive of agroecological initiatives, such measures can also work to undermine agroecological development by creating so-called 'perverse incentives', such as the removal of old-growth hedgerows to be able to qualify for funds for planting new hedgerows.

Respondents overwhelmingly pointed to the local scale as the ideal scale for funding initiatives, underlining the important role of municipal governments in the distribution of funds. Yet this channel of funding is unevenly used as not all municipalities, in all countries, administer funding for agricultural development. Funding via the LEADER approach and Local Action Groups was highly praised by multiple respondents,supporting the view that the local scale is crucial toeffecting agroecological transitions.

Similarly, it was pointed out that smaller amounts of funding for small initiatives, small groups or cooperatives generally have a stronger impact on enhancing agroecological development than large-scale funding for large programmes, which are often only accessible to large farms and businesses due to the transaction costs involved in the application process.

The most fundamental barrier remains the unequal playing field which is geared towards large-scale farms. The problem is not just lack of support for small scale or agroecological farmers, but the existing support for conventional, large-scale, industrial production. This holds true both for public funding, as well as private investments and loans from financial institutions. Further, receiving subsidies through the CAP comes with administrative difficulties such as transaction costs, time, effort and the complexity of bureaucratic processes,which is often more challenging for small- scale agroecological farmers due to the higher diversity that is found in the field and within smaller plots.

Recommendations

1. Fund projects that are dedicated to all levels and dimensions of food system change.
2. Avoid projects that are too large (beyond 10-15 million), as it couldconcentrate power.
3. Integrate long-term thinking into funding strategies and allow transformative results over time, including the continuation of successful projects after reassessment and amendments.
4. Develop results-based payments that reward evidenced results (e.g. increasing soil carbon content and insects, less pollution, higher welfare).
5. Increase the understanding and capacity of agroecology by supporting participatory agroecological research; introducing agroecological expertise into agricultural colleges and training programmes; and create farmer-to-farmer knowledge exchanges and field schools.
6. Create intelligent and responsive funding mechanisms with simplified application processes; free or low cost advisory services for small farmers to access funding; more small-scale funding opportunities; and more flexible funding schemes which empower applicants to experiment with agroecological principles.
7. Empower local governments and municipalities to dispense funds to localinitiatives, and continue to build and provide funding via the LEADER approach.
8. Create an enabling environment for agroecology by strengthening the development of short food supply chains (including public procurement);value and support small agroecological farms and enterprises, including those under 1 ha in size; support new entrants to use agroecological practices; and educate advisory services and bank personnel on the potential of agroecology.
9. Think and act systemically by overcoming siloed conversations, connecting institutions and ministries, and building integrated thinking and funding.

The way forward

For a paradigmatic transformation of food and farming systems, increased investments are needed in every aspect of the food system. Our research has shown that across Europe good examples do exist to support agroecology. These can be used as models to be scaled out in other contexts.

Crucially, it is necessary to create more accessible and effective funding for agroecology to reach ‘grassroots’ actors on the ground, that is, the growing agroecology movement, which includes many young people and new entrants into farming, as well as small-scale farmers more broadly. Further work to level the 'unequal playing field' is needed, which the forthcoming Horizon Europe Agroecology Partnership is set to help with. In addition, better support for agroecological innovations, both social and technical, and a food system approach fostering short food supply chains and a change to healthy diets and zero food waste is vital.

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Images

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Authors

Jesse Donham -
Agroecology Europe,
BelgiumNina Moeller
- Coventry University
Ulrich Schmutz -
Coventry University
Alexander Wezel -
ISARA, France
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#6 Policy Brief – Enhancing opportunities for agroecological transformations of farming and food systems in Europe – addressing missing links

Enhancing opportunities for agroecological transformations of farming and food systems in Europe—addressing missing links

AE4EU

November 28, 2023

The challenge

Our current food systems cannot continue as they are. Soils, rivers, and the atmosphere are polluted, biodiversity, in particular of insects, and ecosystem services are declining rapidly due to continued use of chemical industrial agricultural inputs, while a third of all food produced is wasted. In addition, the lack of 'animal welfare' (lack of daylight, not free-range), and 'farmer welfare' (long hours, low social status) is unsustainable.

Agroecology aims to comprehensively transform food and farming systems in all dimensions, from production to distribution and consumption as well as governance. The aim is to achieve greater environmental and societal benefits while reversing the negative effects caused by existing food systems. Yet, an agroecological transformation – involving a range of transitions in relation to the above-mentioned dimensions of farming and food systems – requires valuing agroecology and making available investments that strengthen innovative agroecological approaches, support new (types of) markets, and help food system actors break free of current lock-ins. Knowing where the constraints and challenges lie, as well as knowing how these could be addressed, is important for enhancing existing strategies and policies, overcoming piecemeal engineering and window dressing, and taking advantage of the full potential of agroecology.

This policy brief provides a short synthesis of insights that emerged from various interactions with key stakeholders involved in the co-creation of the European Network for Agroecological Food systems (ENAF), the various strands of work done as part of AE4EU, and recent literature. This is meant to complement already ongoing initiatives in Europe such as the EU Agroecology Partnership.

The potential and constraints of agroecology in Europe

The potential of agroecology is multifaceted.

Agroecology is an answer to a need: the widely agreed need for a food system transformation to sustainability, the need for a coherent, integral food system perspective based on a (holistic) systems perspective. Agroecology, in the way we present it here, provides just that.

Agroecology is inherently resilience oriented. Agroecology offers value-based principles that are practical in application. Food systems do not become more resilient by aiming for certain goals or visions but through the application of resilience principles/characteristics in the process of working towards such goals and overall vision. This creates a much stronger basis for working towards sustainable food systems.

Agroecology supports the maintenance of uniqueness in a variety of ways by creating room for applications that are fine-tuned to local circumstances. Rather than delivering standardised practices, it focuses on local, cultural, societal, and economic appropriateness. Thus, it counteracts the McDonaldization of society and in turn supports the persistence of variety and uniqueness, which have always been the beauties of cultural diversity and the heritage of unique agricultural systems and practices across the globe.

Agroecology is inherently transdisciplinary in its orientation, a platform where science and society (through movements) not only meet and talk but truly work together, combining different rationalities, experiences, and methods towards transdisciplinary collaboration. In other words, it is inherently transdisciplinary in nature, which cannot be said of mainstream approaches to farming and food systems.

Agroecology is not mere idealism but evidence oriented. There is a growing evidence-base for the efficacy of agroecology for food security. It has been

stated that "a fully agro-ecological Europe [...] could sustainably feed 530 million Europeans by 2050" (Aubert, 2018).

Nevertheless, there are also constraints to agroecology. In the area of transforming agricultural production systems, a constraint is in a lack of practical knowledge about agroecological farming systems. The application of mixed cropping, trap crops, push-pull-systems, wildflower strips tailored to the needs of functionally important arthropod groups such as crop pollinators or natural biocontrol agents, companion plants, or permanent soil cover is almost unknown in practical farming of Europe. Some research exists, but there is a lack of evidence and hence trust in the applicability and functioning (from economic, social and environmental perspectives) of such farming practices. A further constraint is in the missing regional infrastructures for processing produce (e.g. mills, slaughterhouses, roasting facilities etc.), limiting the possibility of establishing regional value chains for agroecological products.

Addressing missing links

Over the past few years, a variety of specific recommendations on enhancing conditions for agroecological transitions have been provided by different researchers and groups of researchers. Some of these recommendations are included in this report, but not all. So far, there appears to be a tendency to cherry-pick loose elements from documented agroecological theory and practice that does not do justice to the integral perspective and the range of opportunities that have been put forward.

Sustainable agriculture and fair and sustainable food systems cannot be achieved through the application of a series of solutions, let alone mere technical/technological solutions. An integrated and coherent approach is needed not just a set of isolated actions. An approach is needed that provides concrete guidance in the form of good principles. And an approach is needed that allows for contextualisation of common principles to create tailor-made specific application options that connect to relevant context conditions. Agroecology offers pathways to localising, contextualising, and diversifying farming and food systems, thus connecting to place-based and identity-oriented values. It is therefore well positioned to help guide European as well as member state policies in relation to farming and food system transformations over the next decades.

The term 'agroecology' does not automatically convey a clear image of what the related integral perspective on farming and food (systems) entails. It may serve its purpose when considered as an umbrella for a range of specific approaches such as organic farming, regenerative farming, etc. However, in its reference to being a science, a practice, and a movement, this is not yet a common understanding. Different people interpret the term agroecology in quite different ways.. Perhaps this is difficult to change, but in that case, more efforts should be invested into communicating the broad perspective of agroecology, if it is to become a more prominent orientation of farming and food systems in Europe.

Partly related to the difficulties related to communicating agroecology, the term has been embraced by many who either limit its meaning to the field of agronomy or use it for window-dressing conventional approaches to agriculture. These two are related in that the restricted interpretation of agroecology makes it possible to apply it to any form of agriculture, as there is always some level of interaction between agronomy and ecology. This reiterates the need for doing something to 1) better distinguish the broad view on agroecology from other views and then to 2) communicate this view better in appropriate fora. This includes the need to more actively engage with conventional agriculture in ways that are appealing to farmers and other actors in the food system.

There is a significant combined potential and capabilities in existing national and European networks around agroecology that can contribute effectively to agroecological transformations of agricultural and food systems in Europe. This is where the energy and motivation for agroecology is. This is where the people

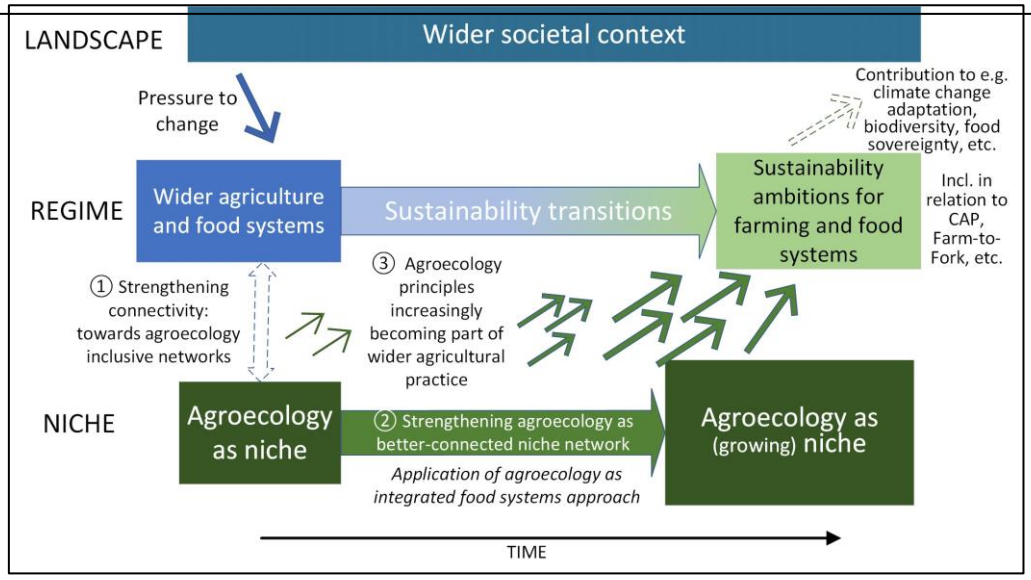
are who dare explore new ways forward and address concerns regarding the unsustainability of current farming and food systems. This is where younger generations are involved—it is critical to involve them in exploring ways forward and give them a serious and significant role in food system transformation. This includes investment by the EU and member states in knowledgeable and experienced agroecologists as ambassadors of and advocates for the integrated farming and food systems approach to agroecology. The European Network for Agroecological Food systems (ENAF), initiated by partners in AE4EU, is one example of related initiatives that are ready for investment.

Although a systems approach is critical in relation to farming and food system transitions to sustainability, context-appropriateness, and societal fairness, in the end it is people who make the difference. What makes farmers interested in agroecology, what makes policymakers interested in supporting transitions to agroecology, what makes consumers interested in investing in sustainable agriculture and food, and what makes managers of (large) companies interested in making the value chain work for transitions to agroecology? The core motivations of all these people makes opportunities tilt one way or the other. These motivations are shaped by people's worldviews, values, and principles, but also by what they do and don't know about. Related communications are a battleground for the minds and hearts of people. European and country-level decision-makers need to become more aware of this battleground and invest more in connecting to the core motivations and values behind agroecology through information and communication.

If transitions to agroecology do not involve a serious rethinking of the foundations of mainstream farming and food systems, they will not add up to a sustainable transformation. This means not putting "new wine in old wine skins"! Current dominant approaches to technology, innovation, and scaling of innovations, as well as payments made to farmers need to be put up for debate. These approaches tend to be considered as having a definitive say on the way forward for farming and food systems. They tend to criticize agroecological approaches for not presenting a realistic alternative, or even go as far as stating that embracing these approaches would increase poverty and vulnerability. This may, however, in many cases be considered as "technology bluff", as Jacques Ellul (1986) framed it.

Investments in agricultural research and development as well as investments in value chains have gone mostly to actors operating with conventional approaches. Hence, conventional approaches have made big steps in fine- tuning systems and applications. In terms of efficiency and productivity, agroecology may be lagging behind, but that is not strange given that only a small percentage of the amount invested in fine-tuning conventional approaches is invested in fine-tuning agroecological approaches. Moreover, agroecology does not reduce farming and food systems to just their efficiency and productivity but pays due attention to other values, to externalized costs, ecosystem services, healthcare implications, farmer livelihoods, etc. To see the full potential of agroecology materialise, serious investment in agroecology as science, practice, and movement is needed. Currently, one very practical way to do this would be to create new funding options for this through both the EU Partnership on Agroecology and through the EU Partnership on Sustainable Food Systems.

Agroecology is not just about another way to approach farming and food systems. It inherently activates resilience characteristics (diversity, redundancy, flexibility, connectivity, collaboration, etc.) of food systems (Zurek et al. 2022). Resilience is ever more important as we face increasing challenges related to the impact of climate change and conflicts. Mixed crop-livestock systems, integration of perennial crops and trees/shrubs into farming systems are important. Lower-intensity or lower-input agriculture enhances resilience by not letting animals, soils, and crops 'walk on their toes' of maximum productivity. These are just some examples of enhancing resilience of farming and food systems and reducing their vulnerability through agroecology.



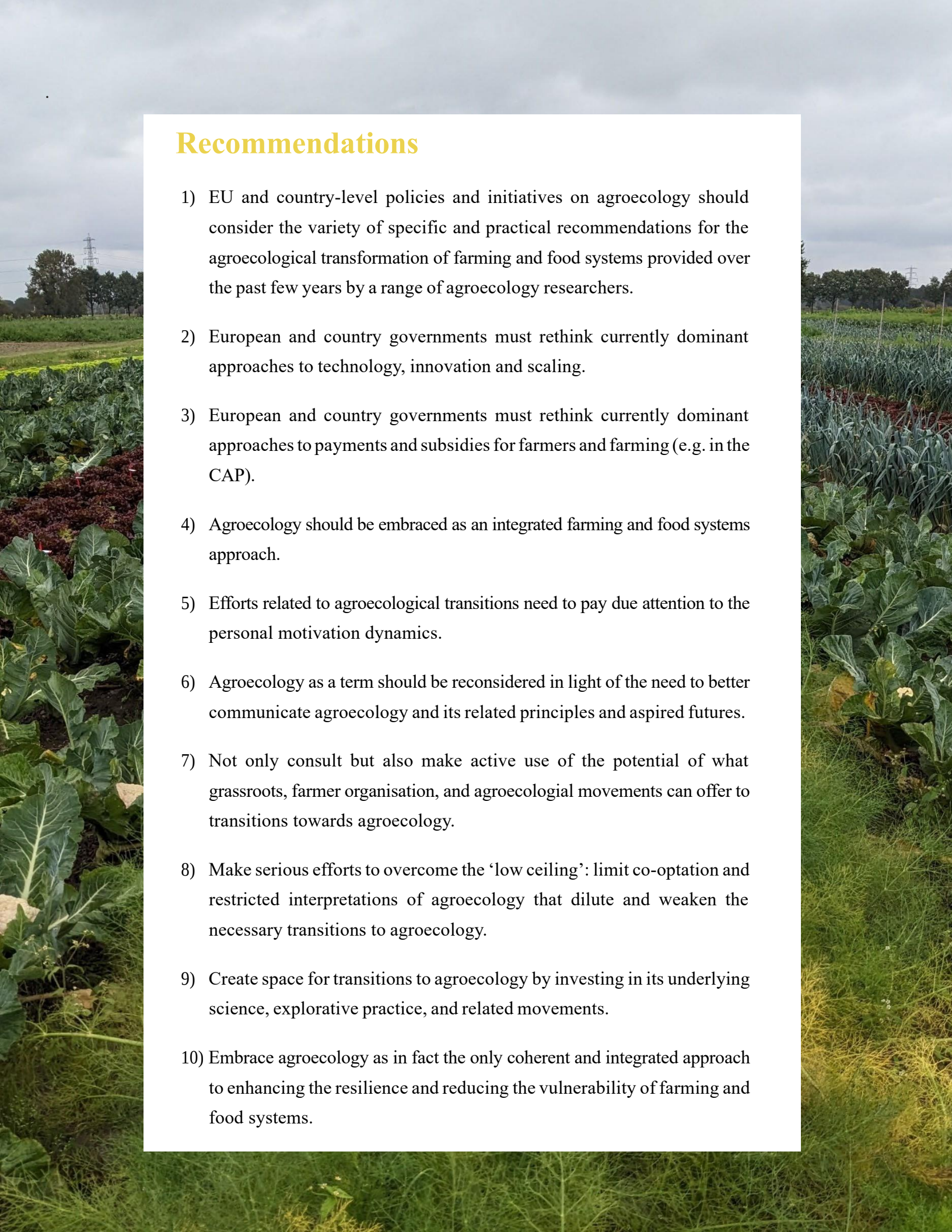
Making agroecology work for sustainable farming and food systems in

Inspiration from the newly established Dutch Agroecology Network

Since World War II, the general trend within the Dutch agricultural sector has been to increase and highly intensify (i.e. efficient or industrialized) production, causing negative side-effects for biodiversity and the natural environment. However, agroecology is currently gaining popularity in The Netherlands, which can be attributed to the emergence and success of various associations, foundations, cooperatives, and organisations that promote it

Since 2012 joint activities and efforts of farmers' organisations, NGOs, students and researchers have given a strong momentum to agroecology. They created the network 'Voedsel Anders' around the term agroecology. More than 2,500 farmers, citizens, activists, researchers, and students from The Netherlands and Flanders, Belgium, participated in a growing network for an alternative food system. Key issues were fair price for farmers, farming in harmony with nature, less power for the agroindustry, healthy and tasty food, short supply chains, fair supply chains, access to land, and influence of farmers and citizens on food.

As of late 2023, first results are promising. Through collaboration between farmers, NGOs, and researchers, and by reaching out to other networks and policymakers, the visibility and potential impact of the Dutch agroecology network has increased considerably. As highlighted during the creation of the network, the commitment of key actors is crucial for building a strong network and organisation. Developing trust and understanding between farmers, NGOs and researchers needs time, but it was found to be crucial for successful joint action. Relying on a set of key principles (based on Nyéléni declaration) is important to prevent greenwashing and preserve the transformative character and orientation of the network.



Recommendations

1) EU and country-level policies and initiatives on agroecology should consider the variety of specific and practical recommendations for the agroecological transformation of farming and food systems provided over the past few years by a range of agroecology researchers.

2) European and country governments must rethink currently dominant approaches to technology, innovation and scaling.

3) European and country governments must rethink currently dominant approaches to payments and subsidies for farmers and farming (e.g. in the CAP).

4) Agroecology should be embraced as an integrated farming and food systems approach.

5) Efforts related to agroecological transitions need to pay due attention to the personal motivation dynamics.

6) Agroecology as a term should be reconsidered in light of the need to better communicate agroecology and its related principles and aspired futures.

7) Not only consult but also make active use of the potential of what grassroots, farmer organisation, and agroecologial movements can offer to transitions towards agroecology.

8) Make serious efforts to overcome the 'low ceiling': limit co-optation and restricted interpretations of agroecology that dilute and weaken the necessary transitions to agroecology.

9) Create space for transitions to agroecology by investing in its underlying science, explorative practice, and related movements.

10) Embrace agroecology as in fact the only coherent and integrated approach to enhancing the resilience and reducing the vulnerability of farming and food systems.

The way forward

There are said to be three major themes of barriers to agroecological transitions: actor capacity, value chain, and policy (Gava et al. 2022). This policy brief illustrates how unlocking the potential of agroecology goes deeper than addressing these challenges, because they (e.g. the lack of appropriate policies) connect to deeper root causes related to mindsets, dispositions, and values. We do see more happening than ever before on the European landscape, putting agroecology on (policy) agendas (Miller et al. 2022). The EU Agroecology Partnership offers new opportunities for advancing agroecology through its orientation on strengthening living labs and research infrastructures. However, as significant as this is for agroecology in Europe, it also has its limitations. Therefore, complementary initiatives and approaches are necessary to enhance opportunities for agroecological transformation of farming and food systems in Europe. The European Network for Agroecological Food systems (ENAF) is but one of such initiatives.

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Authors

Seerp Wigboldus, Jan Hassink, Margriet Goris, Andrew Dawson—Wageningen University & Research
Jens Dauber—Thuenen Institute of Biodiversity Boglarka Bozsogi—Agroecology Europe

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#7 Policy Brief: European Network for Agroecological Food Systems (ENAF)

AE4EU

AGROECOLOGY FOR EUROPE

EUROPEAN NETWORK FOR AGROECOLOGICAL FOOD SYSTEMS (ENAF)

Jesse Donham, Boglarka Bozsogi, Seerp Wigboldus, Margriet Goris

AE4EU

August 14, 2023

Introduction

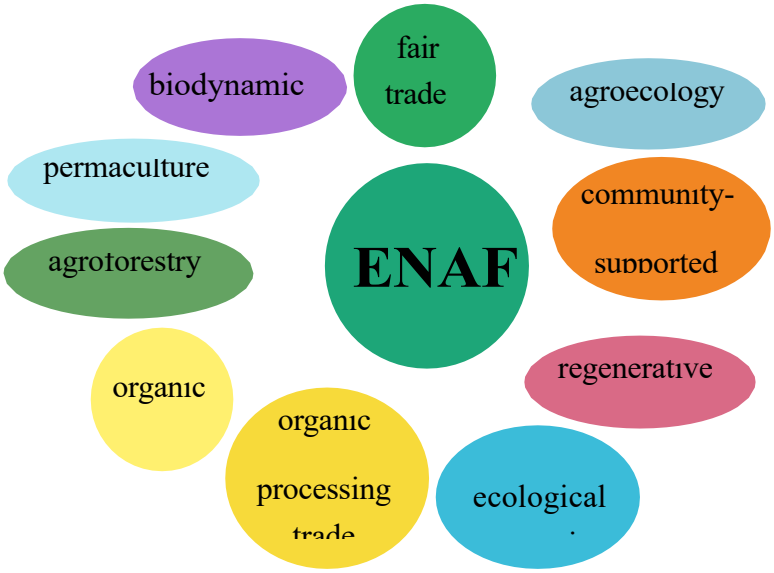
The global food system is flawed. Not only is it not delivering healthy and nutritious food but it is also a key contributor to environmental degradation, biodiversity loss, malnutrition, rural poverty and climate change, to name a few. Agroecology has gained momentum within scientific, academic and political spaces as an alternative and holistic approach that incorporates considerations that go beyond the farm gate and can be applied at the field, farm, regional, national and whole food system level.

In order to strengthen the processes and mechanisms related to an agroecological transformation of farming and food systems, the AE4EU project envisioned a platform where networks and associations could come together to pool knowledge and resources, and to provide mutual encouragement and support to enhance the potential impact on advancing the application of agroecological principles. After a year of deliberation amongst the project and various other networks and groups from across Europe, the European Network for Agroecological Food Systems (ENAF) was founded as a network of networks on 26 January 2023.

Growing from common ground

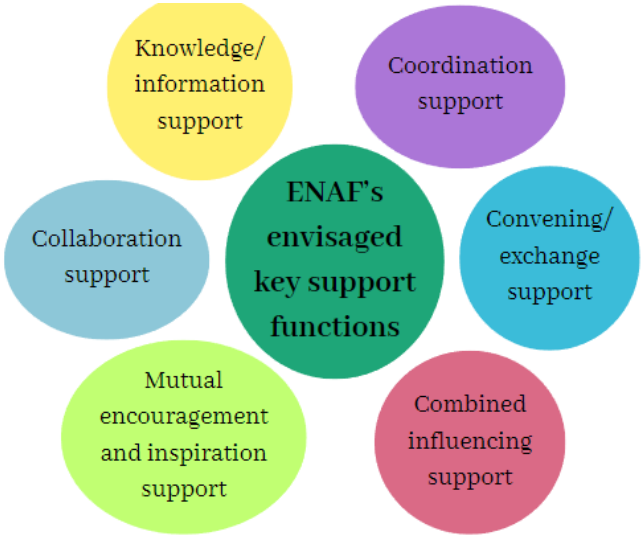
The network was founded as a way for various networks to have a platform for exchange on both practice and policy in order for farmer and civil society networks to learn from one another across borders. Coming together creates a common voice from the values shared across networks toward a common vision. By sharing resources and information, grassroots organisations normally on the periphery of decision-making processes in agriculture can have more impact on research and policy agendas.

ENAF's mission is "to activate the combined potential and capabilities of existing national and European networks to be able to contribute more effectively across sectors to agroecological transformations of agricultural and food systems in Europe." Its aim is to create a body that will be guided by voices from the bottom up and bring to the fore the voices of small-scale farmer organisations from all corners of Europe. This in itself is its added value, as agroecology has historically been more present in Western Europe and less in Eastern Europe. This larger range of perspectives will create a more democratic, unbiased perspective, that will allow everyone to be part of agroecological transitions in their own contextualized way. The strength of agroecology is its ability to create a system that is not one-size-fits-all. The food system transitions must create room to follow small-scale, agroecological, local pathways.



ENAF focuses on connecting existing networks, associations, and umbrella organisations, not individuals or individual organisations, with the aim of complementing what the networks already work on while increasing synergies and supporting a shared effort to enhance the efficacy of their work. This includes creating opportunities for a stronger, combined voice and influence in relation to policy and research agendas. Additionally, it allows ideas to spread more rapidly across national boundaries, thus supporting local innovation.

ENAF is rooted in an understanding of agroecology as an integrated food system approach that gives equal value to social, economic, and environmental dimensions. The vision of ENAF is to see people across Europe enjoy all the good that comes with food systems grounded in the principles of agroecology, since they are environmentally conscious, socially just, and economically fair. While all of the various members and co-founders of ENAF orientate themselves in different ways, for example identifying as organic, biodynamic, regenerative, or community-supported, they focus on the common ground and converge around agroecology.



Governing the network of networks

ENAF's governance follows the principles of decentralization, democratization and responsibility, the values we want to see in the food system of the future. While the network was founded by a handful of organisations, the governance of the network will occur in rotation, with an equal balance of larger, Europe-wide networks and associations and smaller national networks. This is to ensure that the network continues to focus on the bottom up and not create another EU-focused organization or academic space.

ENAF was founded by three international organisations, Agroecology Europe, Slow Food, and La Via Campesina, and two national ones, Ecoruralis (Romania) and Agroecologie Network (Netherlands). The governance positions for national networks are envisioned to rotate. Any organisation can join as long as they contribute in some way to a nature-centred transition in agriculture.

Membership will be divided between members and followers. Members are formally accepted into the network and have voting rights, whereas followers are interested in the goals of ENAF but for various reasons are not members.

In this early stage, ENAF is finalising a governance strategy. Its diverse member networks are identifying points of agreement and common ground, centring around a bottom-up approach and nature-based solutions. Other approaches and practices, for instance climate farming or organic certifications, will require more discussion and debate to arrive at a shared position. ENAF's two-pronged external strategy will envision how this ecosystem can open up to the world, influencing the EU agenda while strengthening bottom-up approaches. These codified internal and external strategies will solidify the structure and mission of a newly founded entity, consolidating lessons learned, synergies, and expertise from the AE4EU project before it spins off at the project's end. To discuss all of these and outline the next steps and priorities, the network will meet for the first time in person at the Agroecology Europe Forum in November 2023, in Hungary.

To summarize, the uniqueness of ENAF is that it brings together European and national agroecological bodies that represent agroecological farmers. Therewith, it becomes a valuable partner for the European Partnership on Accelerating farming systems transition: agroecology living labs and research infrastructures. ENAF will contribute to essential tasks of the European partnership on Agroecology, such as building a research infrastructure of farmer-led knowledge production and sharing knowledge on agroecology across Europe. A European network of networks that supports farmer innovation on agroecology will accelerate the transition. Furthermore, the resulting alignment across farmer-led national and European networks on polices that support agroecological practices will ensure significant steps towards sustainable farming and food systems in Europe. This way, ENAF complements multi-actor living labs and research infrastructures mainly steered by scientists. However, the continuity of ENAF requires a substantial effort of founding organisations to allocate sufficient labour hours to ENAF. Previously it was suggested by diverse stakeholders involved in the European Partnership development, that this partnership may provide opportunities for ENAF. **Therefore, with this policy brief, we call for a yearly contribution to ENAF by the European partnership on agroecology.**

For more information

European Network for Agroecological Food systems (ENAF)
https://www.ae4eu.eu/european-network-for-agroecological-food-systems/

European R&I partnership on agroecology living labs and research infrastructures https://research-and-innovation.ec.europa.eu/research-area/agriculture-forestry-and-rural-areas/ecological-approaches-and-organic-farming/partnership-agroecology_en

Authors

Jesse Donham, Agroecology Europe, Belgium

Boglarka Bozsogi, Agroecology Europe, Belgium

Seerp Wigboldus, Wageningen University & Research, Netherlands

Margriet Goris, Wageningen University & Research, Netherlands

More information about the H2020-Agroecology for Europe project:
www.ae4eu.eu
www.twitter.com/ae4eu_H2020
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Additional policy briefs created by AE4EU can be found at:
www.ae4eu.eu/agroecology-in-europe/policy-briefs/

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#8 Policy Brief: Establishing an effective European network of Agroecology Living Labs: Entry points from a farmland biodiversity perspective

ESTABLISHING AN EFFECTIVE EUROPEAN NETWORK OF AGROECOLOGY LIVING LABS: ENTRY POINTS FROM A FARMLAND BIODIVERSITY PERSPECTIVE

Diana Sietz, Sebastian Klimek, and Jens Dauber

AE4EU

December 21, 2023

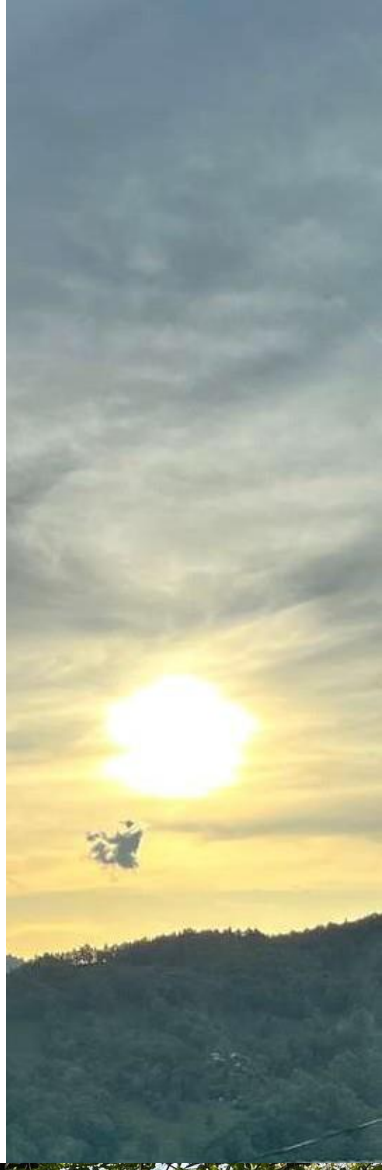
Scope

This Policy Brief presents a synthesis framework aimed at supporting the EU Partnership on Agroecology Living Labs and Research Infrastructures in its vision to establish an effective European network of living labs. It reaches out topolicy and partnership coordinators as well as practitioners, providing insights to inform their decisions on where and which kind of living lab to fund in the future. This decision support can help to fully achieve policy targets related to farmland biodiversity and an agroecological transformation of European farming.

Farmland biodiversity crisis

The intensification and specialisation of food production have fundamentally altered agriculture during the past decades. Although productivity often increased, yields have plateaued in many high-productivity regions in Europe and worldwide. At the same time, the high input of synthetic fertilisers and pesticides and the loss of semi-natural habitats have substantially accelerated the loss of biodiversity in agricultural land systems, i.e., decreased farmland biodiversity. This has impaired essential ecosystem services such as pest regulation, pollination, and nutrient recycling that are associated with farmland biodiversity and required for the functioning of many farming practices, in particular agroecological practices. Hence, agriculture needs to be transformed in order to reverse the ongoing biodiversity and food system crisis.

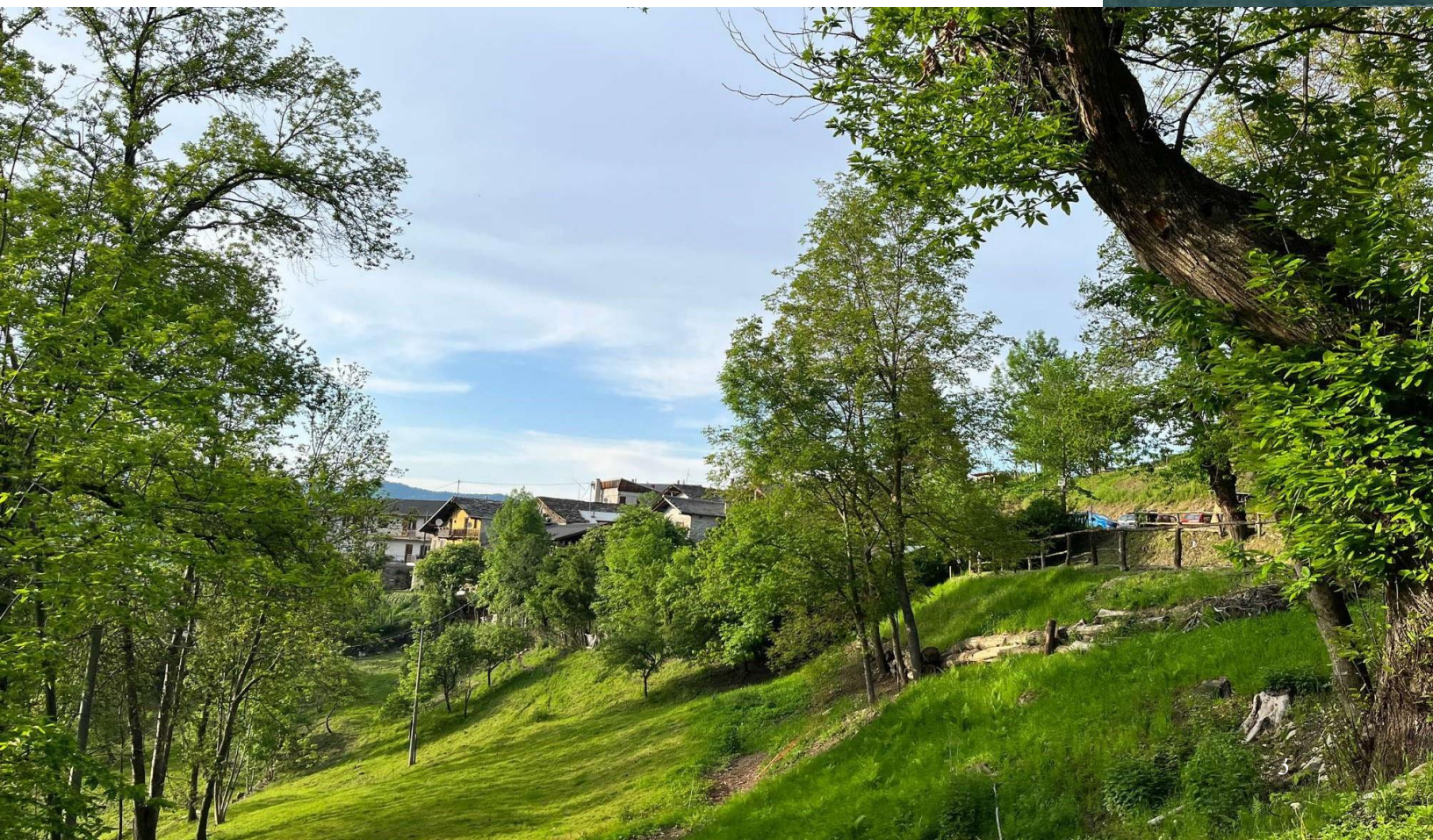
At the heart of the European Green Deal, a range of policy objectives have been framed to support this transformation. For example, the European Union'sFarm-to-Fork Strategy set targets to reduce chemical pesticide use by 50%, nutrient losses by at least 50%, fertiliser use by at least 20%, and to farm 25% of agricultural land organically by 2030. However, regional differences in agricultural intensity, farming practices, and biodiversity in Europe greatly challenge the achievement of these uniformly defined policy targets. To increase the currently limited effectiveness of policies, policymakers need to tailor targets to specific farming systems. The newly formed European Partnership on Agroecology Living Labs and Research Infrastructures raises the question: how should a network of living labs be composed to suitably cover differences in farming contexts and co-design tailor-made application options of farming practices?



Option space for agroecological transition

Systematic understanding of the interactions between agriculture and farmland biodiversity is crucial to address this question. Empirical evidence shows a declining relationship between agricultural production and farmland biodiversity, which can be illustrated as S-curve (Figure 1a). Agricultural production subsumes land use intensity, management strategies, and the composition of agricultural landscapes. It depicts a gradient ranging from extensive land use, (e.g., low livestock density, no-tillage) in complex landscapes where agriculture is embedded in a semi-natural habitat matrix, to intensive land use, with high external inputs and structurally simplified or cleared agricultural landscapes. Farmland biodiversity captures all species that live in and around agricultural land and provide ecosystem services.

Extensive farming systems that have well-structured landscapes and maintain high biodiversity resemble the conditions in the upper part of the S-curve(Figure 1a and example in Figure 1b). Here, abandonment can decrease farmland biodiversity (see lower branch of the S-curve in upper left-hand corner, Figure 1a). Hence, extensive farming needs to be maintained to avoid this degrading branch pointed out by a functional space called minimum required production. Yet, abandonment may also increase farmland biodiversity to some extent linking to natural or rewilded landscapes (see dotted branch in upper part of the S-curve, Figure 1a).



line, Figure 1a). This transformative vision implies that at a given level of agricultural production, farmland biodiversity increases. The area between the current relationship and the transformative vision indicates the option space for transformative change (see light green area, Figure 1a). Farming systems may transition to this option space in the future depending on their current conditions and applied farming practices.

Agroecology provides established knowledge and proven practices to guide the necessary transformation of farming and food systems over the next decades. It shifts the focus away from maximising productivity toward optimising the use of natural resources and biodiversity, providing affordable healthy food, and building resilience. Decreasing or phasing out agrochemical inputs and reorganising agricultural management are key elements of agroecology essential to alter the structure and functioning of agriculture. Yet, agroecological practices are context-specific and need to be fitted to the diverse interactions between agriculture and farmland biodiversity. For example, diversified crop rotations, establishing semi-natural habitats at field edges, and managing service-providing species contribute to intensifying ecological processes in more intensively used farming systems with low farmland biodiversity (see Type C, Figure 1a). These practices can reduce pest infestation and the need for insecticides while increasing crop yields and profitability. In contrast, mixed grazing of cattle and sheep can simultaneously enhance farmland biodiversity and livestock production in extensively used farming systems that still contain high biodiversity (see Type A, Figure 1a).

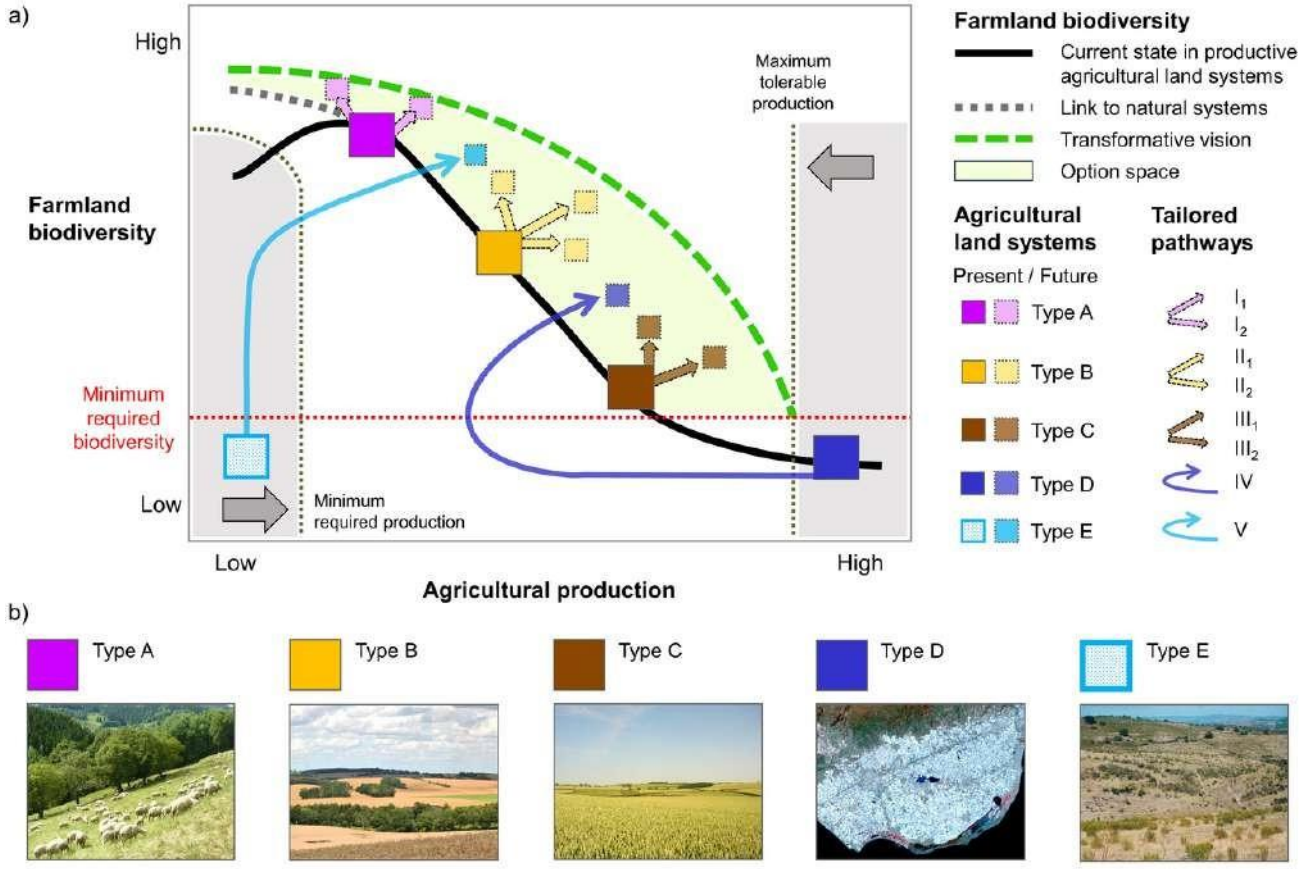


Figure 1 Synthesis framework to guide the development of the European network of agroecology living labs and research infrastructures.

1a) S-curve depicting the current relationship between agriculture and farmland biodiversity and option space between the current relationship and transformative vision. Examples of farmingsystem types are given together with possible future locations in option space and tailored pathwaysto reach these locations. Boxes with solid borders indicate present conditions of agricultural production and farmland biodiversity in various types of farming systems. Boxes with dotted borders represent possible envisaged conditions in the future.

1b) Photographs presenting real-world examples of farming system types. These include low-intensity sheep grazing in a structurally complex mountainous landscape, southern Germany (Type A), medium-intensive crop production in a diverse landscape with forest remnants, south-eastern Germany (Type B), high-intensity cereal cropping in a simple, homogenised landscape, England (Type C), intensive horticultural production in a severely disturbed landscape due to massive greenhouse constructions and agrochemical inputs, south-eastern Spain (Type D), and abandoned land with severe soil erosion and land degradation, southern Portugal (Type E).

(Photo credits: Type A—Sebastian Klimek, Type B—Diana Sietz, Type C—Jens Dauber, Type D—NASA/GSFC/METI/ERSDAC/JAROS, U.S./Japan ASTER Science Team, Type E—Pedro Cortesao Casimiro).

Developing an effective European network of living labs infrastructures

This integrative view on the current relationship between agriculture and farmland biodiversity and the option space for transformative change provides a synthesis framework to guide the development of a European network of agroecology living labs and research infrastructures. Seven steps set out the framework's application below. Two steps (3.1) support the Partnership in building a comprehensive network of living labs and research infrastructures. One step (3.2) addresses policy effectiveness requiring action in both living labs and the Partnership. The remaining four steps (3.3) are focussed on a clear understanding of current conditions and potential future development in living labs and associated farming systems.

Comprehensive network of living labs

From the perspective of the European Partnership on Agroecology, the synthesis framework presented here may help to define priority regions for establishing living labs to address the most pressing transformation needs. It may further help to balance the number and distribution of living labs across Europe and structure the discussion of where to establish living labs so that they form a network that effectively fosters the envisaged agroecological transformation across Europe.

The framework may also serve to systemise information on the coverage of current relationships between agriculture and farmland biodiversity and envisaged areas in the option space of transformative change. For example, if clusters in the position of current living labs would be apparent along the S- curve (see Figure 1a), then the reasons for such clustering would need to be identified. Important aspects to clarify would be if particular conditions are not relevant for agroecological transformation or if they exist only inunderrepresented niches in Europe. In turn, living labs' regional distribution in Europe can be mapped onto the S-curve to reveal regions with similar current interactions between agriculture and farmland biodiversity but different drivers of current conditions, future conditions envisaged in the option space oftransformative change, and/or transformative pathways leading to these envisaged future conditions. If gaps remain in the current distribution of living labs, the European Partnership can launch calls for living labs in explicit regions to purposefully adjust and build up the network of living labs.

In developing promising solutions and testing these on real farms with farmers and other food system actors, the thirteen principles of agroecology help focus actions aimed at starting or reinforcing transformative change. For example, land and natural resource governance may be a priority element to develop innovative policies (e.g., regulatory laws) that reward regenerativeproduction in a living lab located in a region resembling the conditions depicted in Type C (seeFigure 1a). In contrast, culture and food traditions may be prioritised in a living lab located in a region resembling the conditions depicted in Type A (see Figure 1a). This can support the Partnership on Agroecology Living Labs and Research Infrastructures in designing vivid spaces for long-term, contextualised experimentation and providing direction for research activities on agroecology at European scale.

Effectiveness of current policy targets

EU strategies and laws target general goals but their objectives are not effective under all farming and environmental conditions. It is therefore recommended to assess which policy objective can effectively re-enhance farmland biodiversity and ecosystem services while safeguarding food production under given current conditions. The framework presented here is designed to help evaluate conditions under which existing policy targets, such as those defined by the EU's Farm-to-Fork Strategy, are suited to support the sustainable transformation of farming systems.

For example, the targets of a 50% reduction in chemical pesticide use, a 20% reduction in fertiliser use, and a 50% reduction in nutrient losses would be most ecologically effective in intensively used farming systems (see Type C, Figure 1a). They lay the foundation for transformative change based on an intensification of ecological processes. To enable this, it may be essential to establish semi- natural habitats (e.g., hedgerows, tree lines) allowing wild species to recolonise these farmingsystems and provide ecosystem services. In its original form, the proposed Nature RestorationRegulation defined a minimum target of 10% of agricultural land with high-diversity landscapefeatures underlining this necessity. In contrast, the target to farm 25% of agricultural land organically is best suited for farming systems with intermediated land use intensity and landscape complexity (see Type B, Figure 1a). Farming systems resembling Type A (Figure 1a) are often characterised by high-diversity landscape features and low inputs of pesticides and fertilizers. Here, the abandonment of farming poses a threat to both food production and biodiversity. Hence policiestargeted towards stabilising socio-ecological systems, for example via improving social services in rural communities, designing new value chains for goods, and developing novel agroecologicalfarming opportunities, may be most effective under those Type A conditions.

Potential future development of living labs

The framework allows to analyse the potential of living labs regarding their contribution to agroecological transformations. First, the current position of a given living lab can be analysed along the S-curve (see example boxes with solid borders, Figure 1a). This allows to contextualise the living lab in the full gradients of agricultural production and farmland biodiversit analyse the potential of living labs regarding their contribution to agroecological transformations. First, the current position of a given living lab can be analysed along the S-curve (see example boxes with solid borders, Figure 1a). This allowsto contextualise the living lab in the full gradients of agricultural production and farmland biodiversity.y.

Second, the factors and processes that drive the current status of farmland biodiversity, including the composition and configuration of agricultural landscapes and intensity of agricultural production, need to be examined. This helps to specify how agriculture and farmland biodiversity interact in a given living lab.

Third, depending on the current interplay between agriculture and farmland biodiversity, possible future locations can be defined for a living lab in the option space for transformative change (see boxes with dotted borders, Figure 1a). The envisaged locations of future farming systems imply various changes in agricultural production and farmland biodiversity. Co-design is essential to reflect and balance different stakeholders' expectations, demands, and preferences, as well as the specific social-ecological context of a living lab.

Last, transformation pathways can be defined to link the current and envisaged future positions (see tailored pathways, Figure 1a). These pathways need to be tailored to the characteristics of current farming systems. Targeted farming approaches using agroecological principles can be tested in the living labs to underpin the tailored pathways with contextualised management approaches.

Recommendations

To the European Partnership on Agroecology Living Labs and Research Infrastructures

1) Define priority regions for establishing living labs to address the most pressing transformation needs.

2) Balance the number and distribution of living labs across Europe.

To the European Partnership on Agroecology Living Labs and Research Infrastructures and practitioners in agroecology living labs

3) Assess which policy objective can effectively re-enhance farmland biodiversity and ecosystem services while safeguarding food production under given current conditions.

To practitioners in agroecology living labs

4) Determine the current position of a farming system along the S-curve

5) Evaluate drivers of the current status of farmland biodiversity

6) Co-design the envisaged location of the future farming system

7) Co-design associated transformation pathways linking the current and envisaged positions

Further reading

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Authors

Diana Sietz, Sebastian Klimek, and Jens Dauber—
Thünen Institute ofBiodiversity

More information about the H2020-
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#9 Defining agroecology from a policy perspective

DEFINING AGROECOLOGY FROM A POLICY PERSPECTIVE

Key recommendations for the post 2027 Common Agricultural Policy 1

Authors: María Rosa Mosquera-Losada, Nuria Ferreiro-Domínguez, Francisco Javier Rodríguez-Rigueiro, Antonio Rigueiro-Rodríguez, José Javier Santiago-Freijanes

December 2023

Forward

Agroecology was defined by the "Agroecology partnership" as "dynamic and holistic approach to agriculture considered at the same time a science, a set of practices and a socio-political movement aimed at supporting the transition of agri-food systems towards more sustainable practices. It aims at connecting science, practice and society and to trigger the adoption of a set of policies aimed at sustainable agricultural practices". Considering the transition levels provided by SCAR-Agroecology working group, the current CAP promotion of agroecology in Europe is mainly focussed in the "incremental" phase associated with the "agro-ecosystem level" while the "transformational" phase linked to the "food system level" is not so relevant. The agroecology partneship definition includes several approaches as the practices and the socio-political movement that must be included to indeed reach the needed agroecological transition of food systems in Europe, highlighting the principles of the Farm to Fork strategy. However, this broad definition does not provide concrete practices to be promoted by the CAP linked to land use (arable crops, permanent grasslands, permanent crops and somehow forestry), which is the main basis for CAP payments. The aim of this policy brief is to provide a "practical" agroecology definition for policy makers and the subsequent classification into practices that can be promoted by policy makers.

Defining agroecology

Agroecology practical definition is linked to two the incremental phase of the agroecological principles linked to the agroecosystem level and the transformational phase of the agroecological principles associated with the food system level. Agroecology agroecosystem-based definition

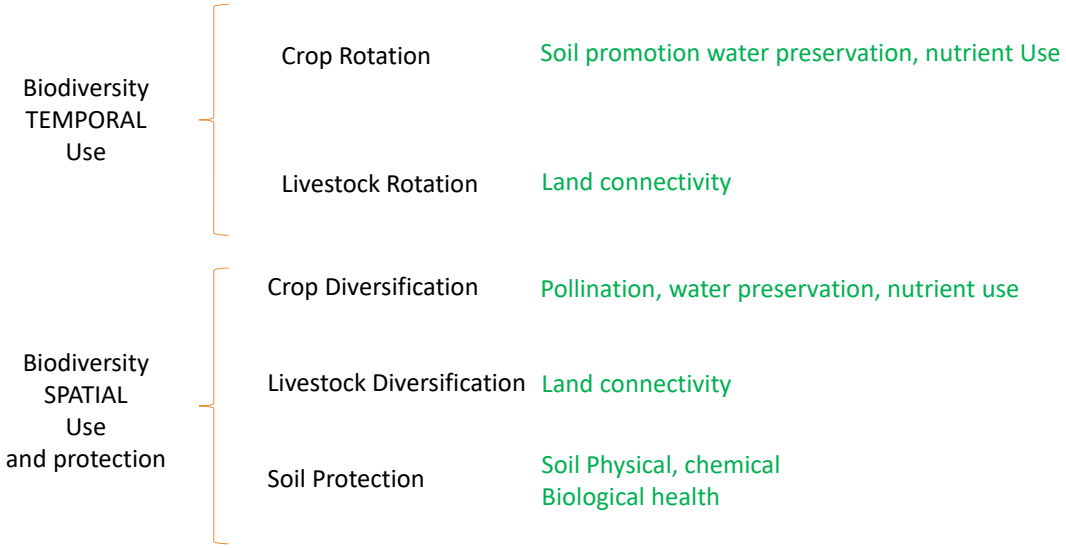
Agroecology agroecosystem level definition is the agricultural spatial and temporal biodiversity preservation, enhancement, use and integration at multiple scales to increase resources use efficiency while improving ecosystem services delivery». Agroecology identifies crop and livestock rotation as the temporal use of the biodiversity and the crop and livestock diversification as the spatial use of the biodiversity, while soil biodiversity protection, enhancement and restoration are seen as a form of biodiversity preservation.

Crop rotation and livestock rotation as well as crop diversification and livestock diversification and the soil protection, enhancement and restoration agroecology subcategories can be seen in the below Table

Agroecology social definition is the dynamic social construction within and among actors that fosters knowledge and activities exchange processes and continuous learning among different stakeholders: producers, processors, retailers, advisors, researcher and consumers aiming at implementing the agroecology main principles or elements. The social movement associated with the agroecological elements should be fostered based on the horizontal knowledge sharing among peers and stakeholders, collaboration and cooperation among peers and stakeholders and the promotion of short and diversified value chains.

Crop and livestock rotation and diversification

Agroecology agroecosystem-based definition



Main agroecology agroecosystem-based definition practices

The temporary use and preservation of the biodiversity involves both crop and livestock rotation.

Crop rotation implies the sequential cropping of different types of crops. Different crops have different types of edaphoclimatic requirements (there are summer and winter crops) but also different types of nutrient needs. This fact enhances the diverse use of the edaphoclimatic and nutrient that will enhance complementarity and synergies between the different crops. Examples of this are the catch crops defined as crops able to reach maturity in a relatively short time planted between two main crops and grown in consecutive seasons. Catch crops rapidly uptake nutrients to be further used as green manure, incorporating the nitrogen that could have been lost if the cash crop was not sown. Cash crops are also known as soil structure improvers within the crop rotation framework. Crop rotation can be performed within a year, between 1 and 5 years and above five years, determining short, intermediate and long crop rotation. The promotion of crop rotation should be enhanced by the CAP at multiple temporary scales including the short, intermediate and long term (agroforestry) rotations.

Livestock rotation involves the use of animals in different crops that are consecutively grazed, therefore connecting different environments, enhancing nutrient cycles and promoting biodiversity. Compared with continuous grazing systems, livestock rotation generates lower grass height and gaps that increases biodiversity and therefore climate resilience. Grasslands gaps allows the establishment of annual species. Livestock rotation may be performed within a farm basis (within farm rotation), or not including short (transtermitance) and long pathways to perform the livestock rotation (transhumance). The promotion of crop rotation should be enhanced by the CAP at multiple temporary and spatial scales including the short, intermediate (trastermitance) and long term (trashumance) rotations as a form to optimize the use of the resources and increase land connectivity and therefore enhancing biodiversity

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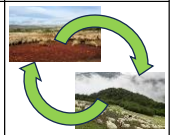
CROP ROTATION								
Temporary scale								
Practice	Scale	Land use	Temporary scale	Explanation	Main purpose	Description	Example	
CROP ROTATION	Same plot (plot scale)	Agrculture	Short rotation	annual	Increase annual production, reduce nitrate leaching	annual crops based: Winter cereal or cover crop+ summer cereal	"wheat or rye or barley or oat or ryegrass" + "maize or sorgum"	
		Agriculture	Intermediate rotation	between 2 and 5 years	Reduce pest, weeds, increasing soil health	annual crop based: Cereal + legume + dicot + fallow land	rye or wheat + clover or lucerne + brassica	
		Agriculture and/or forestry	Long term rotation	over 5 years	Improve soil health in low productive areas, increase soil carbon	permanent crop based:permanent crop + cereal	example: permanent grassland (7 years) + 3 year cereal or Ulex shrublands 10 years + 3 years cereal	
LIVESTOCK ROTATION								
Livestock temporary scale								
Practice	Scale	land use	Croop use	explanation	Main purpose	Description	Example	
LIVETOCK ROTATION	Main Farm grazing basis	agriculture, and/or forestry	arable crops, permanent grasslands, forest land	within farm rotation	increase resource efficiency, biodiversity enhancement, reduce animal production costs, improve soil fertility	Animals rotating within the different land uses farm	Croplands residues grazing after harvesting	
	No main farm grazing basis	agriculture, and/or forestry	arable crops, permanent grasslands, forest land	close farm area rotation. Trastermitance	improve soil fertility, resource efficiency, biodiversity enhancement, improve animal productivity, improve grassland quality	Animals rotating in nearby areas close to the farm, including cooperative grazing	Nearby mountains grazing	
		agriculture/forestry	arable crops, permanent grasslands, forest land	trashumance	better use of the resources, reducing cost production costs, soil improvement, biodiversity enhancement	Long distance grazing	Cross-region grazing	

CROP DIVERSIFICATION								
Spatial scale								
Practice	Scale	Land use	Mixture	Mixture type	Main purpose	Description	Example	
CROP DIVERSIFICATION	Same plot (plot scale)	Agriculture	Variety	Mix of croop varieties in the same plot	Increase biotic and abiotic factor resistence	Permanent or annual crops variety mixtures	The use of varieties of chestnut to avoid frost effects in the production of chestnut fruits	
		Agriculture	Species (herbaceous)	Mix of crop species in the same plot	Increase productivity and quality	Mix of legumes and cereals	i.e. mixed sward, vetch + oat	
		Agriculture and/or forestry	Species (herbaceous and woody, therefore silvoarable)	Mix of woody perennials and herbaceous crop species in the same plot	Increase soil fertility, ensure water and temperature conditions for the herbaceous crop, increase soil carbon	Agroforestry	i.e. silvoarable silvopasture	
	nearby plot (farm or landscape scale)	Agriculture and/or forestry	species in patches (silvoarable or silvopasture)	patches distribution	Diversify production ensuring income, reduce pests effects, increase farm climate neutrality (if woody perennials are part of the system), increase soil carbon	crop diversification + agroforestry (if woody perennials are involved)	i.e. patchy landscapes	
LIVESTOCK DIVERSIFICATION								
Spatial scale								
Practice	Scale	land use	crop use	Explanation	Main purpose	Description	Example	
LIVESTOCK DIVERSIFICATION	Mix of livestock breeds	agriculture/forestry	high diversified permanent grasslands includign woody perennials	mix of breeds adapted to different types of nurtient requirements (i.e meat and dairy cows)	improve soil, resource efficiency, biodiversity enhancement, reduce fire risk, protect the environment	Mixed grazing with livestock animals prefering herbaceous or woody perennials	i.e. grazing with meat and dairy cows	
	Mix of livestock species	agriculture/forestry	high diversified permanent grasslands includign woody perennials	mix of species adapted to different types of vegetation (woody and herbaceous)	improve soil, resource efficiency, biodiversity enhancement, reduce fire risk, protect the environment	Mixed grazing with livestock animals prefering herbaceous or woody perennials	i.e. grazing with goats and sheeps or cows	

The spatial use of the biodiversity involves both crop and livestock diversification.

Crop diversification involves the use of different biodiversity traits, varieties, herbaceous, woody, combination of herbaceous and woody (agroforestry) within the same plot or nearby plots. The crop diversification developed in the same plot implies the use of different varieties and species. The different varieties were used in the past for example to ensure chestnut production in areas within the biogeographic transition areas where the predictability of the weather is uncertain (i.e. Atlantic and Mediterranean in Galicia, Spain) ensuring the lack of damage of no timely frosts during the flowering period. The different species can be herbaceous (i.e. legumes and cereals, or mixed swards) and are usually integrating a legume to improve the nitrogen content of the soil. When the combination of species includes a woody perennial we are talking about agroforestry increasing biomass production and soil organic matter. Nearby plot crop diversification is also possible when mixed species are used in nearby plots aiming at diversify production, but also reducing pest effects and increasing pollination. The promotion of crop diversification should be enhanced by the CAP at multiple scales including intraspecific, the inter-specific with herbaceous-herbaceous and herbaceous-woody perennials combinations (agroforestry).

Livestock diversification integrates the genetic preservation of breeds and animals to both increasing resilience in the livestock farming system and contributing to the preservation of the domestic breeds and animals. Farm resilience is based on the different feed needs of animals and breeds that can make them complementary for the use of the resources (i.e. goats and cows) and the type of market products that the different breed and animals can produce, fostering therefore multiple-product farming systems. Biodiversity preservation is highly relevant for Europe that has the 50% of the domestic breeds of the world, half of which are in risk of extinction. The promotion of livestock diversification should be enhanced by the CAP at multiple scales including intraspecific, the inter-specific with to protect the existing livestock biodiversity while promoting farming resilience.

The **biodiversity spatial protection** is linked to the soil physical and chemical promotion. The main soil promotion and protection practices can be split in both soil physical the main biodiversity-based practices linked to the enhancement of soil production. The **soil physical promotion** is associated with minimum or no tillage practices when annual species are cropped or the use of deep rooted species included permanent crops. These practices always increase the soil organic matter. With regard to the soil chemical promotion, it can be associated either with the organic fertilizer optimal use (i.e. manure) or the organic amendments (i.e. compost) use with products with a low and high C/N relationship, respectively. Soil health is also maintained by the reduction or avoidance of all types of biocides.

Soil physique and chemical promotion

The **soil physical promotion** is associated with the minimum or no tillage when annual species are cropped or the use of deep rooted species included permanent crops. These practices always increase the soil organic matter. With regard to the **soil chemical promotion**, it can be associated either with the organic fertilizer optimal use (i.e. manure) or the organic amendments (i.e. compost) use with products with a low and high C/N relationship, respectively. Soil health is also maintained by the reduction or avoidance of all types of biocides. The sustainable soil production is essentially

obtained through the adequate inputs of organic matter to overcome the intensive farming system soil decapitalization at medium and long term. Crop rotation, crop diversification, livestock rotation and livestock diversification play an important role in obtaining these organic matter inputs without external amendments. The use of forest residues as a way to increase soil organic matter is also an excellent landscape nutrient cycling connection that improves sustainable soil fertility promotion that was traditionally used in Europe. Due to the huge soil degradation and the excess of mineral nutrient applied in European soils, the lack of chemicals use and the nutrient accountability is seen as essential.

From an agroecosystem perspective, agroecology is a type of land management that can stands by itself on the use of the biodiversity, but due to the large historical degradation of the agricultural and forest systems in Europe, it is also essential to avoid some practices that destroys biodiversity and landscape level. The main preservation agroecological practices should be linked to (i) **Minimization of conversion**: The minimization of the conversion of land use from forest to agricultural lands but also from permanent crops or permanent grasslands towards arable crops, as these changes moves from more biodiverse areas at aerial and underground level towards more simplified and less ecosystem services supply ecosystem. (ii) **Nature preservation**, Preserving nature specific habitats such as wetlands, peatlands, nature areas as they have a specific site conditions that is linked to specific and special biodiversity that should be protected and (iii**) Soil protection** avoiding bare soils, as this creates a homogeneous habitat poorly linked to biodiversity from an edaphic perspective that deals to soil quality reduction, nitrate leachate, etc…

Food system agroecology

The **transformational agroecology phase** is associated with the **social part of agroecology**, where knowledge exchange and work and investment sharing linked to social biodiversity and interaction is highly relevant. The social component agroecology promotion is deployed in three main pillars associated with (i) **The horizontal knowledge sharing** among the same and different types of stakeholders to reach an objectiv4e or multiple objectives. The first pillar aims at reaching an objective or multiple objectives by sharing knowledge among peers but also among different types of stakeholders.(ii) **Collaboration and cooperation** among peers and among stakeholders types is key to reduce production costs associated to time and infrastructure savings, it also generates social networks. Collaboration among different types of stakeholders is key to promote (iii) **Short and diversified value chains** Optimization of the use of resources within the food system should be as close to consumers as possible either reaching better relationships among value chain stakeholders or having a close product selling with regard to the consumers to promote short value chains

Recommendations for CAP

1. Adopt the agroecology definitions
2. Promote crop rotation within their different scales
3. Quantify the area under crop rotation (see Policy brief Nº 10) and the impact of policy measures on soil physical and chemical promotion interventions
4. Promote crop diversification within their different scales
5. Quantify the area under crop diversification (see Policy brief Nº 10) and the impact of policy measures on soil physical and chemical promotion interventions
6. Promote soil physical and chemical promotion within their different activities
7. Quantify the baseline and the impact of policy measures on soil physical and chemical promotion interventions
8. Foster landscape agroecology-based biodiversity preservation
9. Fostering knowledge sharing, collaboration and cooperation as well as short and diversified value chains as key basis to foster agroecology at EU level.

Images

Goats and dog image by Pablo Fernández Paradela, farm in Navia de Suarna, Galicia

Chestnuts in agroforestry image by José Javier Santiago Freijanes in Galicia

Authors

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Rodriguez-Rigueiro JJ, University Santiago Compostela.

Franco-Grandas T, University Santiago Compostela.

Santiago-Freijanes JJ, University Santiago Compostela.

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#10 Conditionality and agroecology practices

AE4EU CAP POLICY BRIEF 2:CONDITIONALITY AND AGROECOLOGY PRACTICES

Key recommendations for the post 2027 Common Agricultural Policy

Authors: María Rosa Mosquera-Losada, Nuria Ferreiro-Domínguez, Francisco Javier Rodríguez-Rigueiro, Antonio Rigueiro-Rodríguez, José Javier Santiago-Freijanes

December 2023

EU CAP objectives and their alignment with the EU strategies and the FAO agroecology (AE) principles

Forward

The CAP conditionality (previously namely cross-compliance) is a compulsory requisite for farmers to receive EU income support. CAP 2014.2020 has a set of rules identified as Statutory Management Requirements (SMRs) and the Good Agricultural and Environmental Conditions (GAECs), these apply only to farmers receiving support under the CAP. The SMRs are compulsory for all farmers whether or not they receive support by the CAP, while the GAECs apply only those farmers receiving support under the CAP. The fulfilment of SMR and GAEC encourage farmer to comply with high EU standards for public, plant, animal health and welfare. However, there is not a precise local monitoring of the fulfilment of the rules, which may compromise the comply with the high EU standards. CAP 2023-2027 has been enlarged with the so call "social conditionality", integrating the social aspects within the conditionality in the CAP for the first time. The social consideration in the conditionality approaches agroecology principles described by the FAO, that underlines together with the different EU strategies, the last CAP objectives.

This policy brief aims at analysing the role of agroecology agroecosystems and food systems practices within the conditionality framework.

ENVIRONMENTAL CONDITIONALITY

The environment conditionality is divided in three main areas associated with the (i) Climate and environment, (ii) Public and plant health and (iii) the animal welfare. The new EU conditionality (2023-2027) is based on a set of standards for good agricultural environmental condition of land (GAEC) and statutory management requirement (SMR). The classification of the GAEC and SMR attending the their main purpose within each Conditionality topic can be seen in the next page table. The below table shows the allocation of the GAEC and SMR to the different AE biodiversity promotion and protection type and the structure linked to climate and environment, public health and plant health, and animal welfare topics. From the 8 GAEC, 75% are associated with soil biodiversity promotion, 50% with crop rotation while 62.5% is linked to crop diversification. For the SMR 45% is linked to soil biodiversity protection, 36% associated with Crop

Rotation activities, while 54% and is related to Crop and livestock diversification.

Classification of GAEC (good agricultural environmental condition of land) and SMR(statutory management requirment) based on the CAP the purpose they have and the type of agroecological practices linked to the GAEC and the AE practice type positive effect on SMR.SB : soil biodiversity promotion, CD: Crop diversification, CR: crop diversification; LD: livestock diversification

Topic	Purpose	GAEC	GAEC description	AE biodiversity type
CLIMATE AND ENVIRONMENT	Biodiversity protection	GAEC 1	Permanent grassland maintenance	SB, CD
		GAEC 2	Protection of wetland and peatland	SB, CD
		GAEC 3	Ban on burning arable stubble	SB, CD
		GAEC 5	Tillage management	SB
		GAEC 9	Ban on converting or ploughing permanent grasslands in Natura 2000 sites	SB
		GAEC 6	Avoid bare soil	SB, CR
	Biodiversity enhancement	GAEC 6	Avoid bare soil	CR
		GAEC 4	Establishment of buffer strips along water courses	CD
		GAEC 7	Crop rotation	CR
		GAEC 8	Non-productive areas or features in agricultural areas	CD
	Purpose	**SMR**	**SMR description**	**AE practice positive effect**
	water protection	SMR 1	Control diffuse sources of pollution by phosphates	SB, CR, CD
		SMR 2	Water protection against pollution caused by nitrates from agricultural sources	SP, CR, CD
	Habitat protection	SMR 3	Wild birds conservation	CR, CD
		SMR 4	Conservation of natural habitats and wild flora and fauna	CR, CD
PUBLIC HEALTH AND PLANT HEALTH	Food safety	SMR 5	Food safety procedures	CR, CD
		SMR 6	Ban on the use of substances having a hormonal or thyrostatic action and beta antagonists	SB
	Plant protection	SMR 7	Plant protection products market	SB
		SMR 8	Sustainable use of pesticides and restrictions	SB, CR, CD
ANIMAL WELFARE	Animal protection	SMR 9	Minimum standards protecting calves	LD
		SMR 10	Minimum standards protecting pigs	LD
		SMR 11	Protection of animals kept for farming purposes	LD

GAEC: Protecting biodiversity

Both **Permanent grassland maintenance** and the **Ban on converting or ploughing permanent grasslands in Natura 2002 sites mean** grazing and no ploughing therefore increasing biodiversity (trampling, urine and faeces distribution and animal selection (Buttler et al. 2009)) while also no tillage in soil and therefore enhancing soil protection. Both grazing and the lack of tillage increases soil carbon sequestration, that should be quantified to have a baseline to understand how the CAP money increased the permanent grassland maintenance at least in the marginal lands with authocthonous breeds (Rigueiro-Rodríguez et al. 2009). These benefits should also contribute to increase the extent of permanent grasslands and extensive farming systems. Moreover, permanent grassland is linked to grazing for adequate maintenance, therefore a measure that promotes livestock diversification (authocthonous breeds promotion) if marginal lands are grazed. The protection of peatlands and wetlands, banning burning arable stubble, tillage reduction, land ploughing and avoid bare soil are associated with the reduction of greenhouse gases (GHG) emissions while preserving existing soil biodiversity. The development of buffer strips, crop rotation and maintenance of landscape features in agricultural areas (including woody perennials associated with agroforestry practices) enhance biodiversity.

The **protection of wetlands and peatlands** are essential to further protect current systems against climate change, as both areas have

large carbon stocks. Soil organic carbo stocks in the EU-27 are estimated that cover more than 593727 km2 or the 5.5% of the land surface in Europe that stores over the 20% of the total terrestrial soil carbon stocks (Zak et al. 2022). Moreover, these habitats are associated to special and specific biodiversity that should be maintained.

Burn on burning arable stubble being a traditional practice in many areas it releases carbon directly to the atmosphere instead of being incorporated into the soil and depending on the temperature and timing of the burning will destroy soil fauna, flora and microbiological biodiversity. On the other side, there is the prescribed burning in shrublands that allows plants to rejuvenate the systems is the extension is not to large, this allows to increase biodiversity (as grasses combines with shrubs and to maintain the protected shrublands areas in good conditions to be preserved, this is known as pyric herbivory (Fuhlendorf 2008) as shown the EU projects Open2preserve, COMPAS and Pyric-Labs.

Tillage management, practices like minimum tillage and no tillage associated with permanent crops establishment or direct sowing reduces the soil carbon stock releases while maintaining the biodiversity as described by Kertesz and Madarasz (2014).

Avoid bare soil can be considered both a biodiversity protection tool that can be overcome by employing biodiversity in crop rotation agroecological practices. Bare soils are very poor habitats conducting to very poor biodiversity content that increases the risk of contamination (nitrate leaching) and soil erosion and therefore minimizing the ecosystem services delivery that should be avoided (Burkhard et al. 2019)

GAEC: Enhancing biodiversity

Enhancing biodiversity is reached by the different agroecological practices. Besides **avoid bare soil** through the use of Crop rotation, **crop rotation** itself is also promoted as part of the GAEC 7. Moreover, crop diversification is enhanced by using agroforestry (**establishment of buffer strips along water courses** if woody) and the **development of non-productive areas or features in agricultural areas** that may be converted in productive areas if bioeconomy associated with those current non-productive areas is developed.

SMR: Climate and environment

SMRs are related to specific regulations of habitat and water protection that can be enhanced by crop rotation and crop diversification that may reduce the needs of external inputs increasing food safety and at the same time plant protection, therefore, contributing to the promotion of public and plant health. Animal protection is associated with the animal welfare linked to animals living in stables, but do not consider the fact that animal grazing is the best form to enhance animal welfare and protect permanent grasslands. The fact that fulfilment the brand of “animal welfare” SMR requisites is not associated with grazing systems cause a deleterious effect on these sustainable extensive farming systems.

Those SMR associated with climate and habitat protection can be reached by implementing agroecology. For example, the **control of diffuse sources of pollution by phosphates (SMR1)** and the **water protection against pollution caused by nitrates from**

agricultural sources (SMR2) should be controlled in origin when fertilization is carried out, but also, through the reduction of the need of fertilization by using the biodiversity. Therefore, the crop rotation, crop diversification and the soil biodiversity enhancement are seen as key elements to reach the aim of phosphorous but also nitrogen pollution, especially when deep rooted species such as woody perennials is used as agroforestry.

The SMR aiming at protecting habitats for special taxonomic groups such as **birds (SMR3)** but in general **flora and fauna (SMR4)** are highly relevant but easily linked mostly to soil biodiversity protection, crop diversification and crop rotation and considering the reduction of pollution they causes (see SMR 1 and 2) as mentioned before.

SMR: Public health and plant health

Food safety procedures (SMR5) as well the **ban of substances with hormonal or thyrostatic action and beta antagonists (SMR6)** are key to maintain human, animal and ecosystem health across the whole ecosystem nutrient and pollutants cycling that should be linked to the use of more sustainable agroecological practices. Agroecological practices such as crop rotation and crop diversification can broke the cycle of many parasites and microorganisms associated with the habitat modification, while woody perennial livestock grazing in particular can reduce the presence of some helminths parasites in the goats.

The lack of knowledge of biodiversity and the temporary and spatial ecological functions at plot and landscape the biodiversity makes necessary the use of **plant protection products and regulate the market (SMR7)** and determine the **sustainable use of pesticides and restrictions (SMR8)**. The simplification of the systems makes that pest have not natural enemies that diminishes the productivity of the crop. Multiproductive systems where different species are combined is the answer to reduce the impact of pests and weeds on productivity, while promoting diversified markets. The combination of cropland residues with grazing is also key to reduce pests impacts (example grazing uncommercial chestnut fruits after harvesting reduces chestnut diseases in the forthcoming years). Therefore to reduce the impact of plant protection products we should enhance the use of agroecology agroecosystem biodiversity based principles associated with crop rotation and crop diversification.

SMR: Animal welfare

The **SMR9, SMR10 and SMR11** are associated with the minimum standards of **calves, pigs and animals kept for faming purposes** are essential to maintain animal welfare and promote the organoleptic value of the animal products. However, these standards are provided to animals that are in stables. The indoor animals can claim the certificate of “animal welfare” that is not provided to animals that are grazing outdoors and protecting nature when benefiting from them. This causes a distortion in the markets not benefiting grazing as a key activity to enhance ecosystem services delivery in the fields. This is obtained by unofficial brands such as “milk pasture”, “woodlands eggs”.

SOCIAL CONDITIONALITY

The CAP social conditionality is a new concept within the CAP that aims at enhancing the employment and promote the health and safety by promoting adequate working conditions including formation and health. Most of the rules are already compulsory in most of the EU member states but they are now compulsory to receive the direct payments and ensures the fulfilment through the written compromise of the farmers. They can be seen in the below table

.

Employment and health and safety conditions of the 2023-2027 CAP

	SOCIAL CONDITIONALITY
EMPLOYMENT	**Employment conditions**
	Agricultural employment linked to an **employment contract**
	Employment contract provided **within the first seven days of working**
	Changes to the employment relationship to be provided in **documentary form**
	Probationary period
	Conditions regarding **minimum predictability work**
	Mandatory training
HEALTH AND SAFETY	General provision laying down duty of employer to **ensure safety and health workers**
	General obligation on employers to take measures necessary for **safety and health protection, including prevention risks and provision of information and training**
	Protective and preventive services: worker(s) to be designated for health and safety activities or competent external service to be engaged
	Employer to take measures for **first aid, fire-fighting and evacuation** of workers
	Obligations on employers regarding **assessment of risks, protective measures and equipment,** recording and reporting of occupational accidents
	Provision of **information to workers on safety and health risks and protective and preventive measures**
	Consultation and participation of workers in discussions on all questions relating to safety and health at work
	Employer to ensure that workers receive **adequate safety and health training**
	General obligations to ensure that **work equipment is suitable for work** to be carried out by workers without impairment of safety or health
	Rules concerning work equipment: must comply with the Directive and established minimum requirements and be adequately maintained
	Inspection of work equipment – **equipment** to be inspected after instalment and **periodic inspections** by competent persons
	Work equipment involving specific risks to be restricted to persons tasked with using it and all repairs, modifications, maintenance to be performed by designated workers
	Ergonomics and occupational health
	Workers to receive adequate information and, **where appropriate, written instructions on use of work equipment**
	Workers to receive **adequate training**

Recommendations for CAP

ENVIRONMENTAL CONDITIONALITY

Good Agriculture and Environment Conditions

The current state of degradation of European ecosystems makes highly relevant all the GAEC proposals. However, the ones associated with permanent grasslands should be more ambitious and promote the expansion of the extent of this land whenever abandon land on marginal areas exist through extensive livestock farming systems in some Mediterranean areas. Adequate prescribed burning practices ensures shrublands health if carried out in small areas and combined with grazing. No-tillage, minimum tillage and avoiding bare soils are seen as a great measure to preserve the carbon but the introduction of woody perennials to enhance soil carbon stocks is needed in some degraded soils. More proactive GAEC initiatives such as buffer strips along water courses, crop rotation and the inclusion of non-productive areas or features in agricultral areas are more suitable for the current EU degraded soils and ecosystems. No livestock rotation is promoted.

Statutory management requirement (SMR)

The current state of degradation of European ecosystems, the needs of protecting health and ethically promote animal welfare makes highly relevant all the SMR proposals. The links of the use of biodiversity to reduce the needs of fertilizers (water protection), and preserve habitats (for birds, flora and fauna) is not clearly shown. Therefore, a lack of agroecological, biodiversity nature-based solutions are not linked to the SMR as the first step to reduce the SMR1 to 4 aims. There is a lack of connection of the biodiversity potential and their respective ecological functions with the food safety and plant protection. SMR 1 to 8 should be clearly linked to crop rotation, crop diversirication, soil preservation and adequate livestock grazing to reduce the degradation state of the European ecosytems from the very beginning in the CAP besides what is shown and enlarged in the eco-schemes or rural development methods. The SMR 9 to 11 should promote grazing as a way to use and promote biodiversity at various levles and recognize the role extensive grazing systems with a per se brand of fulfilment of the animal welfare requisites that are linked to the plot, farm and ladnscape agroecological practices promotion.

SOCIAL CONDITIONALITY

The CAP social conditionality is a new concept within the CAP that aims at enhancing the employment and promote the health and safety by promoting adequate working conditions including formation and health but unfortunately is not linked to the food system. Most of the rules are already compulsory in most of the EU member states but they are now compulsory to receive the direct payments and ensures the fulfilment through the written compromise of the farmers.

Images

Chestnuts in agroforestry image by José Javier Santiago Freijanes in Galicia

Goats and dog image by Pablo Fernández Paradela, farm in Navia de Suarna, Galicia

Authors

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No101000478.

#11 Agroecology and the ecoschemes from a policy perspective

AE4EU

AGROECOLOGY FOR EUROPE

Agroecology and the ecoschemes from a policy perspective

Key recommendations for the post 2027 Common Agricultural Policy 1

Authors: María Rosa Mosquera-Losada, Nuria Ferreiro-Domínguez, Francisco Javier Rodríguez-Rigueiro, Antonio Rigueiro-Rodríguez, José Javier Santiago-Freijanes

December 2023

Forward

The CAP 2023-2027 ecoschemes establishes a set of voluntary interventions associated with the farmer direct payments that have a fund allocation of at least the 25% of the CAP. The ecoschemes like happened with the GAEC and SMR are mostly linked to the objectives of climate change, habitat protection and health associated with the concept of enhanced conditionality. However, it does not include any social aspect. The way that the EU CAP regulation 2021/2115 is written allows member states to use agroecology as a way to reach the goals linked to climate change, habitats protection and health.

The European Union also provided members states with an inspiring list of potential agricultural practices that ecoschemes can support, mostly linked to the agroecology implementation in agroecosystems: crop rotation, crop diversification, livestock rotation and diversification and soil biodiversity preservation, enhancement and restoration. These practices should be linked to the objectives deployed in the different areas of environment, climate and animal welfare actions under the CAP strategic plans that can be seen in the below table. The potential list of practices were initially associated to a set of "practices" that we organize in this document to facilitate the connection of land and livestock use practices (crop rotation, crop diversification, livestock rotation, livestock diversification and soil biodiversity protection, enhancement and restoration) with the potential contribution to the different target areas of the ecoschemes (climate change mitigation and adaptation, protection of improvement of water quality, prevention of soil degradation, protection of biodiversity, actions for a sustainable and reduced use of pesticides and actions to enhance animal welfare).

In spite of ecoschemes being voluntary they are relevant for farmers to produce in a sustainable way, while obtaining funds. The aim of this policy brief was to analyse how agroecology practices can be fostered by the different eco-schemes and provide a better understanding of the linkages between the ecoschemes and the agroecological principles. The ecoschemes aim at fulfiling some relevant environment areas that can be fulfilled by the different agroecological practices as shown in the below table.

Ecoscheme areas and link with the agroecological practice positive contribution. CR: Crop rotation; CD: Crop diversification, LR: Livestock rotation; LD:Livestock diversification; SP: Soil biodiversity protection, preservation and enhancement.

	ECOSCHEMES AREAS	AE biodiversity type
CLIMATE CHANGE	**Climate change mitigation**, including reduction of greenhouse gas emissions from agricultural practices, as well as maintenance of existing carbon stores and enhancement of carbon sequestration	CR, CD, SP
	Climate change adaptation, including actions to improve resilience of food production systems and animal and plant diversity for stronger resistance to diseases and climate change	CR, CD, SP, LR, LD
HABITATS PROTECTION	**Protection or improvement of water quality and reduction of pressure on water resources**	CR, CD, SP
	Prevention of soil degradation, soil **restoration**, **improvement** of **soil fertility** and of **nutrient management** and **soil biota**	CR, CD, SP, LR
	Protection of biodiversity, **conservation or restoration of habitats or species**, including maintenance and creation of landscape features or non-productive areas	CR, CD, SP, LR, LD
	Actions for a sustainable and **reduced use of pesticides**, in particular pesticides that present a risk for human health or environment	CR, CD, SP, LR, LD
HEALTH	Actions to enhance **animal welfare** or combat antimicrobial resistance	CR, CD, SP, LR, LD

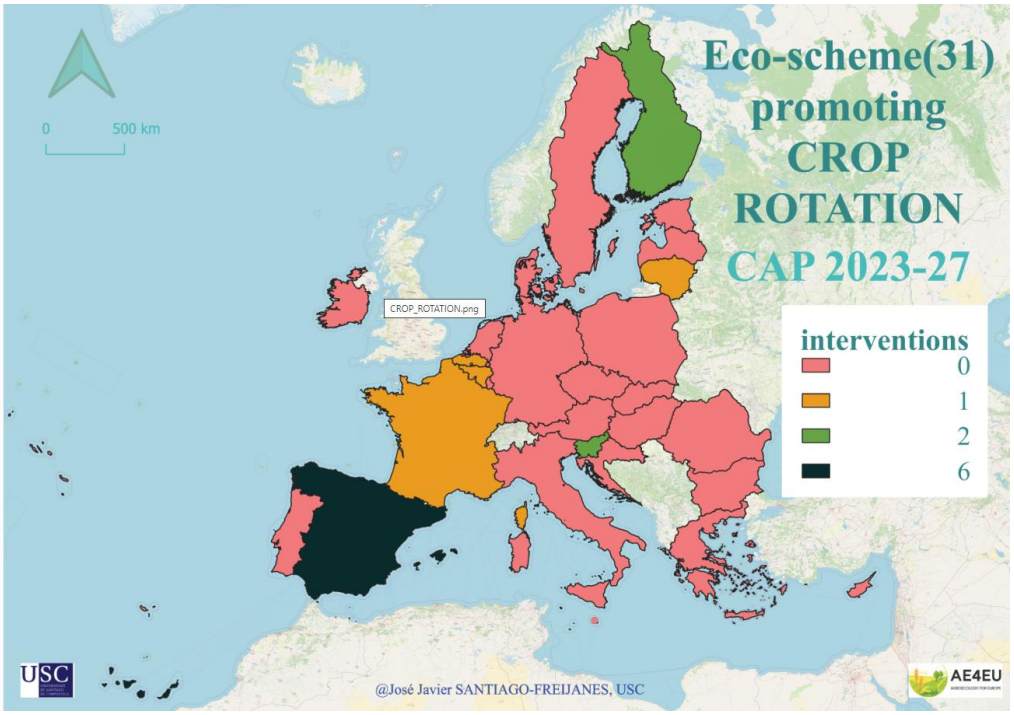
Crop rotation ecoscheme based practices

The crop rotation practice associated with the ecoscheme topic and name list provided by the European commission (2021) and their link to the main ecoscheme areas can be seen in below table The ecoscheme practices associated with the crop rotation have the aim of increasing biodiversity (laying fallow), soil fertility (legume use) and reduce nitrate leaching (winter and catch crops) that can be combined with crop biodiversity. The CR practices are able to fulfil all ecoscheme areas with the exception of animal welfare as it is related to crop rotation.

List of ecoschemes provided by the European Commission (2021) linked to crop rotation and associated with the areas of a:mitigation, b:adaptation, c:water protection, d: Soil protection and improvement, e:biodiversity protection and restoration, f: sustainable and reduced use of pessticides, g: actions to enhance animal welfare. Light and dark green shade shows the EU and AE4EU areas that the specific practice fulfills, respectively. The dark green have an explanation for the inclusion

Ecoschem topic	Ecoscheme name		a	b	c	d	e	f	g	Reason behind including extra benefits
IPM	Land lying fallow with species composition for biodiversity purpose	CR								if woody species appears (a), biodiverse areas prevent from soil degradation
Agroecology	Crop rotation with leguminous crops	CR								rotation reduces water leachng (c), i.e. cover crops
Agroecology	Winter soil cover and catch crops above conditionality	CR								Biodiverse systems increasedoptimal use of the resources (a) increasing soil organic matter inputs (d)

The below figure shows the number of ecoschemes interventions promoting crop rotation. In the first year of the CAP 2023-2027 strategic plans, Spain (6), followed by Slovenia (2) Finland 82) and France, Lithuania and Belgium (1) the unique ones that promoted crop rotation.



Number of ecoscheme interventions promoting crop rotation in the CAP 2023-2027

Crop diversification ecoscheme based practices

The below table shows the list of ecoschemes associated with crop diversification. The types of crop diversification promoted by the EU are linked to the use of different varieties, vegetation strips with different aims (pollination, erosion), with pasture promotion related to permanent grasslands.

The number of ecoscheme interventions promoting crop diversification is much more relevant than those enhancing crop rotation. The number of interventions associate with crop diversification are specially large in large countries such as Spain, Germany or France, but low in Ireland, The Netherlands, or some eastern countries (Czech Republic, Slovakia and Hungary).

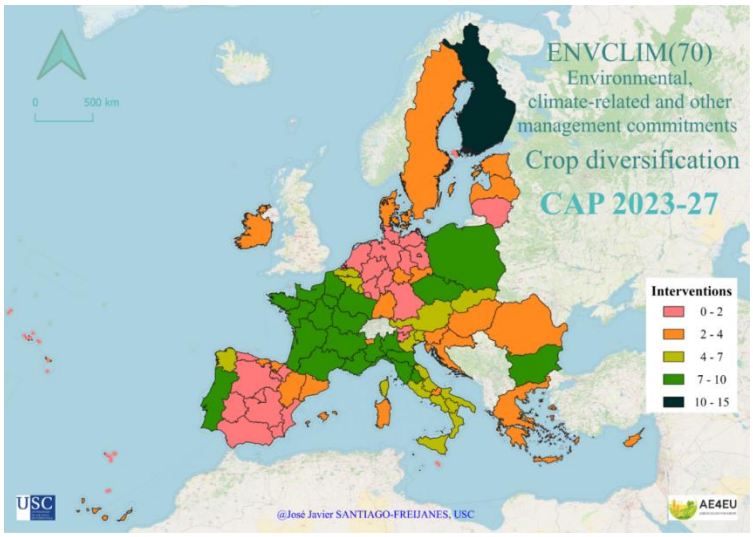
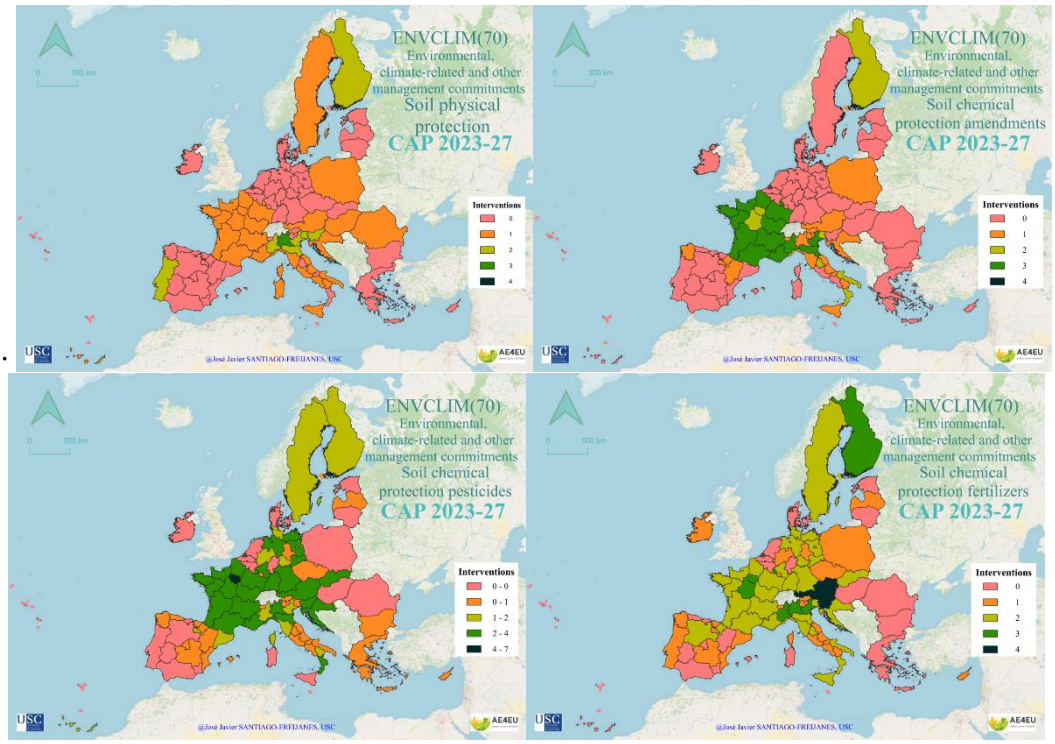


Figure 1 Number of ecoscheme interventions promoting crop diversification in the CAP 2023-2027

Traditional crop rotation with Ulex europeaus to enhance soil health

Soil biodiversity protection, enhancement and restoration based ecoschemes

The below table presents the list of ecoschemes provided by the European Commission linked to soil biodiversity protection, enhancement and restoration. Most of the soil protection and production ecoschemes are associated with the optimal use of the resources. Only one of the ecoscheme practices related to soil is linked to the physical preservation as part of the conservation agriculture. The below figure shows the number of ecoscheme intervations promotiong soil biodiversity associated with the increase of the organic matter, the reduction of the use of pesticides and the lack of promotion of soil tillage. From all soil ecosheme intervaneitons, the increase of soil organic matter and the reduction of pesticides are more selected by the member states than the soil tillage use



Number of ecoscheme interventions promoting soil biodiversity protection, enhancement and restoration in the CAP 2023-2027

List of ecoschemes provided by the European Commission (2021) linked to crop diversification and associated with the areas of a:mitigation, b:adaptation, c:water protection, d: Soil protection and improvement, e:biodiversity protection and restoration, f: sustainable and reduced use of pessticides, g: actions to enhance animal welfare. Light and dark green shade

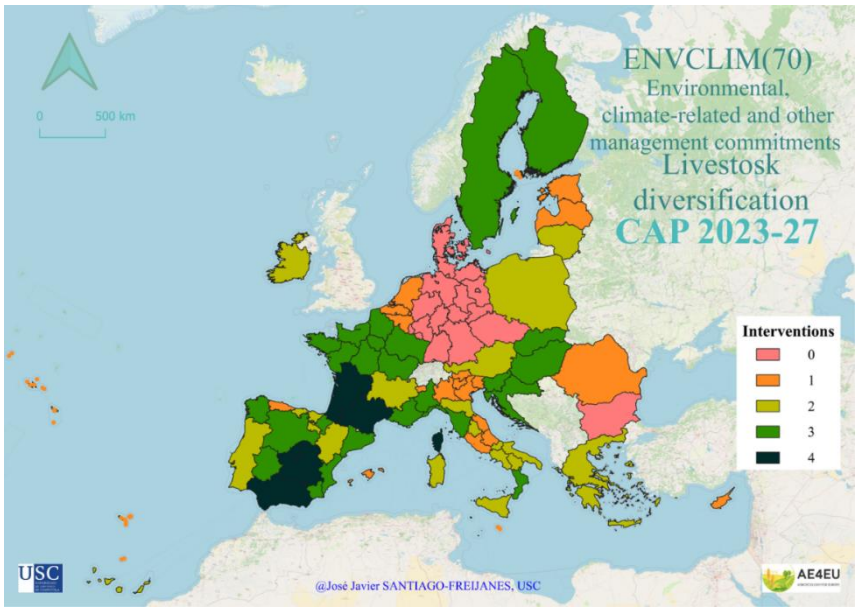
shows the EU and AE4EU areas that the specific practice fulfills, respectively. The dark green have an explanation for the inclusion

Ecoscheme topic	Ecoschem name		a	b	c	d	e	f	g	reason
Carbon farming	Conservation agriculture	SP								Conservation agriculture protects soils and increases soil organic matter improving the temperature and humidity stability in the soils (b)
Carbon farming	Appropriate management of residues I.e. burying of agricultural residues, seeding on residues	SP								Burying agricultural residues increases the soil organic matter improving the temperature and humidity stability in the soils (b) and enhancing soil biodiversit (e).
Precision farming	Nutrients management plan, use of innovative approaches to minimise nutrient release, optimal pH for nutrient uptake, circular agriculture	SP								Adequate nutrient management protects soil biodiversity (e).
Precision farming	Precision crop farming to reduce inputs (fertilisers, water, plant protection products)	SP								Reducing nutrient inputs is related to climate change mitigation due to the non-renewable resource uses to develop (N) and transport (P) fertilizers (a), protects water from nutrient leaching avoidance (c), protects from soil degradation and reduces external inputs (fertiliser, pesticides) (d), and promotes animal welfare as less chemical inputs are available in the environment if the grass or crops are grazed (g)
Improve nutrient management	Implementation of nitrates-related measures that go beyond the conditionality obligations	SP								Reducing nutrient inputs is related to climate change mitigation due to the non-renewable resource uses to develop (N) and transport (P) fertilizers (a)
Improve nutrient management	Measures to reduce and prevent water, air and soil pollution from excess nutrients such as soil sampling if not already obligatory, creation of nutrient traps	SP								

Livestock and grazing ecoscheme based practices

The below table shows the list of ecoschemes linked to livestock and grazing ecoschemes. Out of the 6 practices linked to livestock, the two first are associated with the animal health preservation that can be obtained through grazing. The last four are related to grazing promotion.

The number of interventions enhancing livestock diversification and rotation is much lower than those associated with crop rotation and diversification (see below figure). They are specially important in Rumania. Large countries such as Spain, France or Germany do not promote livestock agroecological practices by the agroecological interventions. Specially relevant in Portugal, Italy, Greece in the Mediterranean areas, in Belgium in the Atlantic zone and in various Eastern European countries.



Number of ecoscheme interventions promoting livestock rotation or diversification in the CAP 2023-2027

Overall Crop Rotation, Crop Diversification, Soil protection and Livestock and grazing ecoscheme based practices

The below table shows the practices associated with the mix of different types of ecoscheme list. The first four practices are linked to organic farming that can and may use all the agroecological practices as a way to ensure biodiversity. The last four are linked to the use of biodiversity in between croplands that may use all crop rotation and crop diversification that enhances soil health and may be used by livestock and grasslands. Besides those, there is the possibility of low intensity management of crops to reduce fertilizer that may be combined with the use of crop rotation, crop diversification enhancing soil health and animal welfare

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List of ecoschemes provided by the European Commission (2021) linked to livestock rotation and diversification and associated with the areas of a:mitigation, b:adaptation, c:water protection, d: Soil protection and improvement, e:biodiversity protection and restoration, f: sustainable and reduced use of pessticides, g: actions to enhance animal welfare. Light and dark green shade shows the EU and AE4EU areas that the specific practice fulfills, respectively. The dark green have an explanation for the inclusion.

Ecoscheme topic	Ecoschem name		a	b	c	d	e	f	g	reason
Husbandry and animal welfare plans	Practices increasing animal robustness, fertility, longevity and adapatbility, e.g. lifespan of dairy cows; breeding lower emission animals, promoting genetic diversity and resilience	LD								Breeding animals with lower emissions causes a better water (c), soil (d) protection, soil biodiversity (e), and increase soil biodiversity (f)
Husbandry and animal welfare plans	Animal health prevention and control plans: overall plan for reducing the rist of infections that require antimicrobials and covenign all relevant husbandry practices, e.g. crawl space between two raring belts, vaccination and treatments, enhanced bioscurity, use of feed aditives, etc..	LR								As grazing is part of the techniques to enhance animal health it is related to climate change mitigation (a), adaptation (b), water protection diminishing the manure production (c), protecting from soil degradation if adequate stocking rates are promoted (d), increasing soil biodiversity (e) and reducing the needs of pesticides (f)
Husbandry and animal welfare plans	Providing access to pastures and increasing grazing period for grazing animals	LR								Grazing with adequate stokding rates enhance animal health it is related to water protection diminishing the manure production (c), protecting from soil degradation if adequate stocking rates are promoted (d), increasing soil biodiversity (e) and reducing the needs of pesticides (f)
Husbandry and animal welfare plans	Provide and manage regular access to open air areas	LR								Grazing with adequate stokding rates enhance animal health it is related to climate change mitigation (a), adaptation (b), water protection diminishing the manure production (c), protecting from soil degradation if adequate stocking rates are promoted (d), increasing soil biodiversity (e) and reducing the needs of pesticides (f)
High nature value (HNV) farming	Shepherding on open spaces and between permanent crops, transhumance and commong grazing	LR								Grazing with adequate stocking rates enhance animal health and permanent pastures that enhances climate change mitigation (a)
Agroecology	Low intensity grass-based livestock system	LR								Grassland biodivesity is enhanced with adequate stocking rate generating animal health (e).

List of ecoschemes provided by the European Commission (2021) linked to crop and livestock rotation and diversificationand so il protection, enhancement and restoration and associated with the areas of a:mitigation, b:adaptation, c:water protection, d: Soil protection and improvement, e:biodiversity protection, f: sustainable and reduced use of pessticides, g: actions to enhance animal welfare. Light green shade shows the EU areas that the specific practice fulfills.

Ecoscheme topic	Ecoscheme name		a	b	c	d	e	f	g	reason
Farm level	Conversion to organic farming	CR, CD, SP, LR, LD								reducing use of inputs (a, e)
Farm level	Maintenance of organic farming	CR, CD, SP, LR, LD								avoiding the use of inputs (a,e)
Agroecology	Practices and standards as set under organic farming rules	CR, CD, SP, LR, LD								reducing use of inputs (a, e), if livestock involved (g)
Husbandry and animal welfare plans	Practices and standards as set under organic farming rules	CR, CD, SP, LR, LD								avoiding the use of inputs (a,e)
High nature value (HNV) farming	Reduction of feriliser use, low intensity management in arable crops	CR, CD, SP, LR, LD								
Agroforestry	Establishment and maintenance of landscape features above conditionaligy	CR, CD, SP, LR, LD								Adequate shade reduces the peak heat damage to cereals (i.e. wheat) grain production (b), the appearance of annual weeds (f) and provides animal welfare (g)
Agroforestry	Management and cutting plan of landscape features	CD, SP, LR								Vegetal landscape features presence (trees, shrubs, etc) increases carbon sequestration mitigating climate changge (a), adequate shade reduces the peak heat damage to cereals (i.e. wheat) grain production (b), increases the uptake of the excess of nutrient protecting waters (c), increases soil organic matter inputs (d) and provides animal welfare (g)
High nature value (HNV) farming	Land lying fallow with species composition for biodiversity purpose (pollination, birds, game feestocks, etc)	CR, CD								Biodiverse systems increases the optimal use of the resources (a) increasing the soil organic matter inputs)
High nature value (HNV) farming	Semi-natural habitat creation and enhancement	CD, LR								

Table 1 List of ecoschemes provided by the European Commission (2021) linked to crop and livestock rotation and diversificationand so il protection, enhancement and restoration and associated with the areas of a:mitigation, b:adaptation, c:water protection, d: S: Soil protection and improvement,

e:biodiversity protection, f: sustainable and reduced use of pessticides, g: actions to enhance animal welfare. Light green shade shows the EU areas that the specific practice fulfills.

Ecoschem topic	Ecoscheme name	a	b	c	d	e	f	g
IPM	Mechanical weed control							
Agroecology	Improved rice cultivation to decrease methane emissions (e.b. alternate wet and dry techniques)							
Husbandry and animal welfare plans	Feeding plans: suitablity of and access to feed and water, feed and water quality analysies (e.g. micotoxiens), optimised feed strategies							
Husbandry and animal welfare plans	Friendly housing conditions: inceased space allowances per animal, improved flooring (e.g. straw bedding provided on a daily basis), free farowing, provision of enriched environment (e.g. rooting for pigs, perching, nest-building materials, etc..), shaing/sprinklers/ventilation to cope with heat stress							
Carbon farming	Rewetting weatlands/peatlands, paludiculture							
Carbon farming	Minimum water table level during winter							
Precision farming	Improving irrigation efficiency							
Other practices related to GHG emissions	Feed additives to decrease emissions from enteric fermentation							
Other practices related to GHG emissions	Improves manure management and storage							

Recommendations for CAP

The ecoschemes list proposed by the European Commission are mostly linked to the agroecological practices associated with crop rotation, crop diversification, livestock rotation, livestock diversification and soil protection, enhancement and restoration. However, livestock rotation is not presented as part of the ecoschemes.

There are several agricultural practices that may involve all agroecological biodiversity-based practices and provide much more ecosystem services, but they are not enough recognized.

The involvement of forest lands as suppliers of fertility to agronomic land, the use of livestock as a way to increase the nutrient cycling and above all of them to improve soil health should be better detailed at local level.

Images

Fired pinus and Chestnuts soil recovery. Note the green areas recovery in the places where chestnut was fired by María Rosa Mosquera Losada in Galicia

Traditional crop rotation in Galicia using the shruby legume Ulex, that was further used as animal bedding and agriculture fertilizers by María Rosa Mosquera Losada in Galicia

Chestnuts in agroforestry image by José Javier Santiago Freijanes in Galicia

All maps figures by José Javier Santiago-Freijanes

Authors

Mosquera-Losada MR, University Santiago Compostela.

Ferreiro-Domínguez N, University Santiago Compostela.

Alvarez-Lopez V, University Santiago Compostela.

Rodriguez-Rigueiro JJ, University Santiago Compostela.

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No101000478.

#12 Agroecology and the environment rural development programme interventions

AE4EU

AGROECOLOGY FOR EUROPE

Agroecology and the environment rural development programme interventions

Key recommendations for the post 2027 Common Agricultural Policy 1

Authors: María Rosa Mosquera-Losada, Nuria Ferreiro-Domínguez, Francisco Javier Rodríguez-Rigueiro, Antonio Rigueiro-Rodríguez, José Javier Santiago-Freijanes

December 2023

Forward

The rural development programmes establish a set of interventions associated with the agroecosystem level of agroecology to be expanded from what was fulfilled in the Conditionality and in the ecoscheme proposals. The Rural Development program can be associated with climate change and habitat protection. Habitat protection have two main types of interventions the natural or other area-specific constraints or those areas with specific disadvantages resulting from certain mandatory requirements.The main aim of this policy brief is to evaluate how agroecological practices are fostered by the rural development interventions

Agroecosystems rural development interventions

The table below shows the main activities associated with the agroecosystem level of agroecology to be expanded from what was fulfilled in the Conditionality and in the eco-scheme proposals. The Rural Development program can be associated with climate change and habitat protection. Habitat protection have two main types of interventions the natural or other area-specific constr4aints or those areas with specific disadvantages resulting from certain mandatory requirements.

Types of agroecosystem based interventions of the Rural Development Programme associated with the CAP 2023-2027

	Types of intervention for rural development
CLIMATE CHANGE	Environmental, climate related and other management commitments
HABITATS PROTECTION	Natural or other area-specific constraints
	Areas-specific disadvantages resulting form certain mandatory requirements

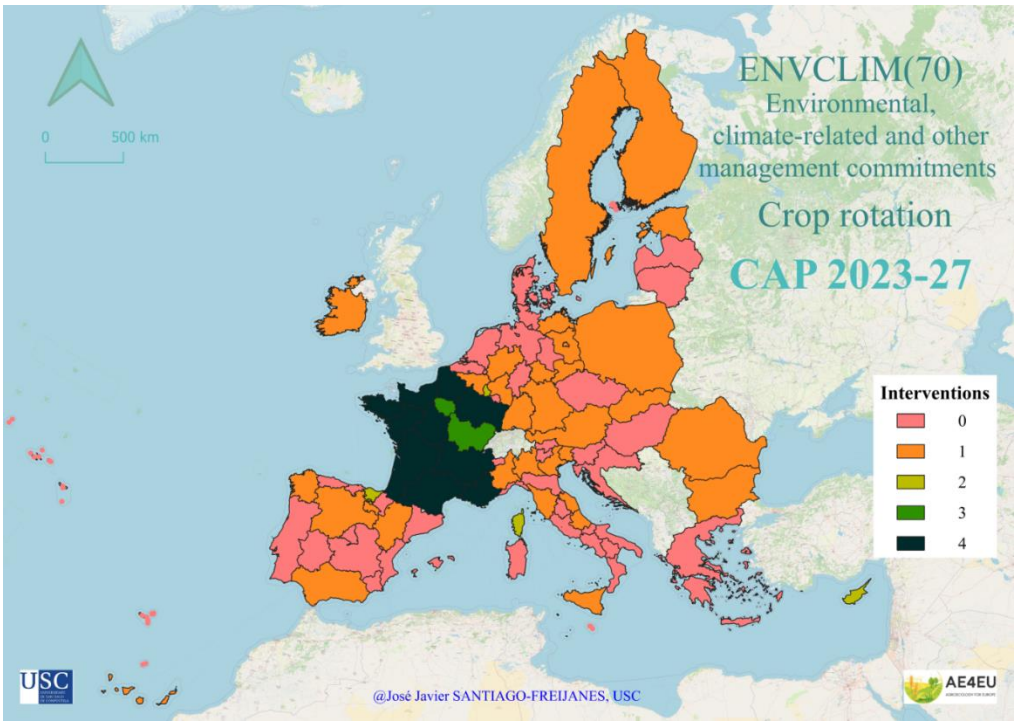
Climate change interventions

The climate change interventions associated with the Rural Development programme of the CAP 2023-2027 were also structured following the main agroecosystem based agroecology practices established by AE4EU (policy brief number 9): crop rotation and diversification, soil biodiversity protection, enhancement and restoration and livestock rotation and diversification.

Climate change interventions: Crop rotation

Crop rotation promotion by the rural development interventions of the CAP 2023-2027 can be seen in the below Figure. Crop rotation is promoted by the 9% of the

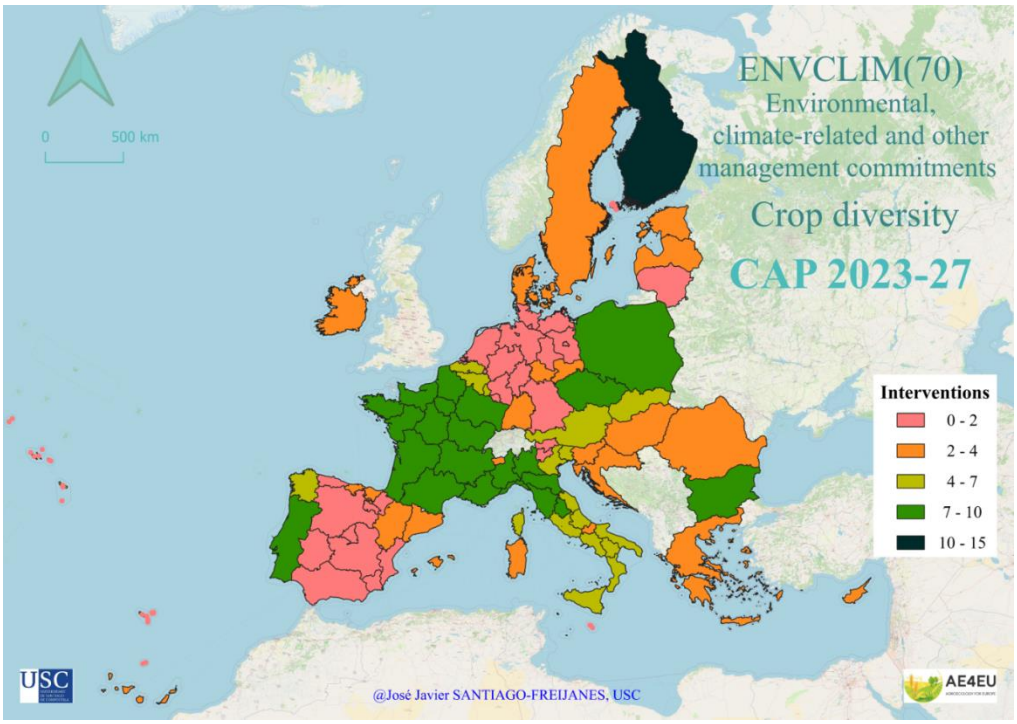
interventions and are linked mostly to France and implemented in a large number of regions in Europe. Compared with the previous CAP (2014-2020), the CAP 2023-20027 promotes much more the crop rotation agroecological practices. The reasons behind the use of crop rotation in the previous CAP were to improve water quality, improving soil fertility and health and sustainability. These reasons within the CAP 2023-2027 were the maintenance of the natural habitats soil protection (including soil erosion and restoration), water protection, organic farming promotion, the biodiversity preservation including habitats and pollinators and an alternative use to pesticides.



Number of rural development interventions promotin gcrop rotation in the CAP 2023-2027

Climate change interventions: Crop diversification interventions

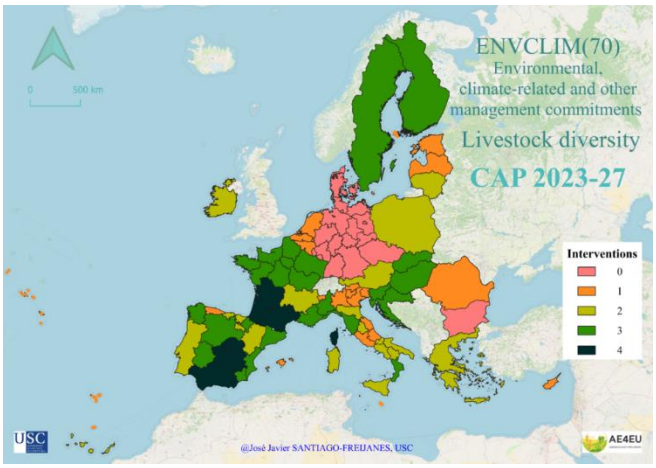
Crop diversification interventions by the CAP 2023-2027 can be seen in the below figure. The percentage or the total measures implementing crop diversification was very high (47%), being the agroecology practice intervention more used across Europe. As happened with the crop rotation, the crop diversification interventions were more spread in the CAP 2023-2027 than in the CAP 2014-2020. The main reasons for using crop diversification were the maintenance of natural habitats, nature conservation, the integrated production, the management of grassland in a extensive form, the use of agroforestry and forestry but also the use of diversification in crops and the protection of crop diversity through the protection of germoplasm banks.



Number of rural development interventions promoting crop diversification in the CAP 2023-2027

Climate change interventions:Livestock diversification interventions

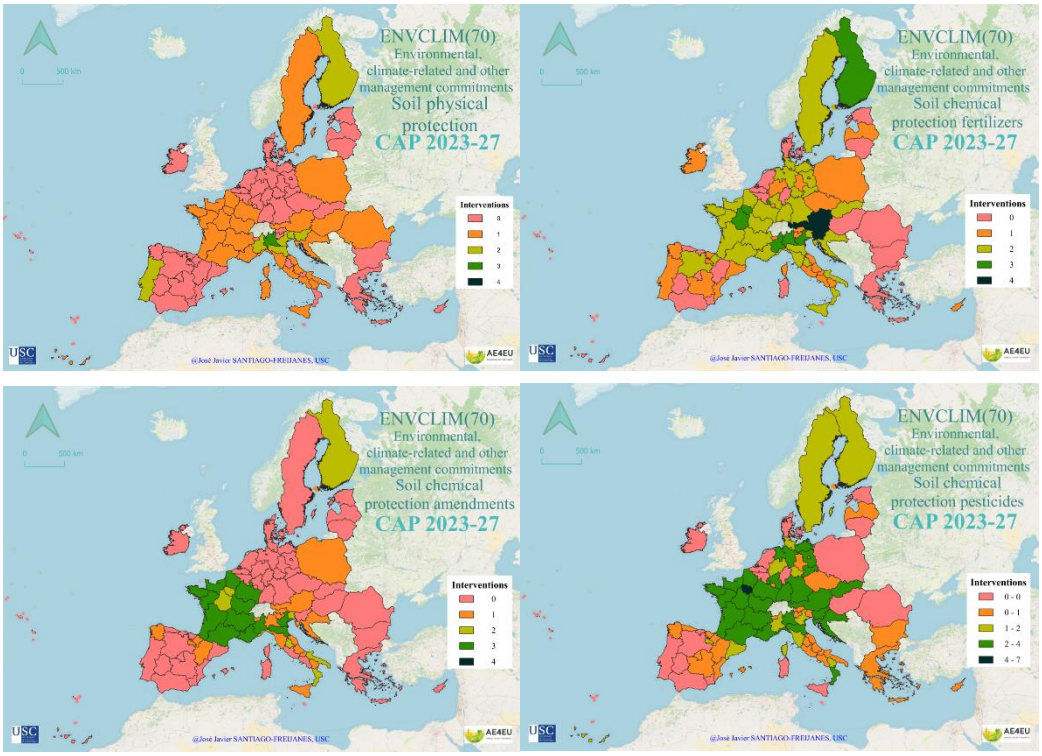
Livestock diversification promotion by the different CAP 2023-2027 interventions can be seen in the below Figure. The rural development widely promotes livestock diversification mainly associated with the preservation of autochthonous breeds across Europe. Livestock diversification is largely implemented in Europe, representing the 17% of the interventions of the whole Europe. The unique large country with a low implementation of this livestock diversification agroecology related interventions was Germany, Czech Republic, Slovakia and Bulgaria. Only France promotes the integration of livestock with the arable and grassland fields connecting this two types of territories and therefore promoting the nutrient cycling and the circular economy.



Number of rural development interventions promoting livestock diversification in the CAP 2023-2027

Climate change interventions: Soil biodiversity protection, enhancement and restoration interventions

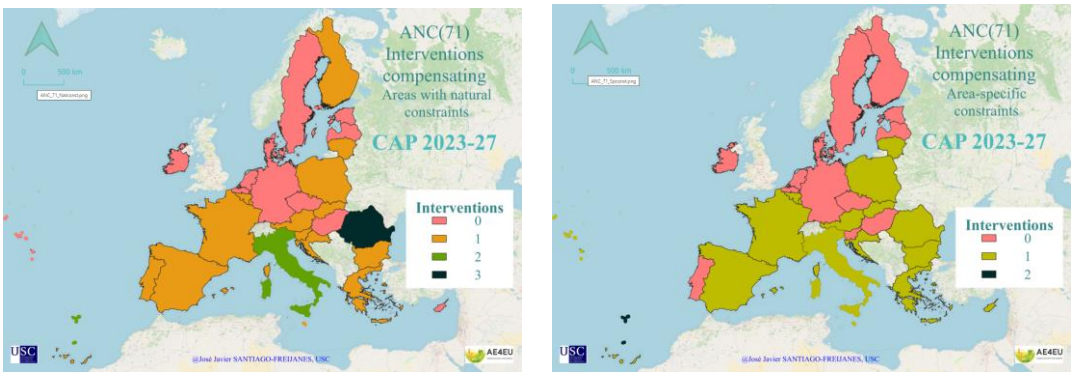
Soil biodiversity protection, enhancement and restoration promotion by the current CAP 2023-2027 can be seen in the below figure. The reduction of the use of pesticides as well as fertilizers are more spreadly promoted that the addition of organic amendments, which is the basis for sustainable agriculture, while soil physical rotation is less promoted.



Number of rural development interventions promoting soil biodiversity protection, enhancement and restoration rotation in the CAP 2023-2027

Habitats protection interventions: Natural or other area-specific constraints

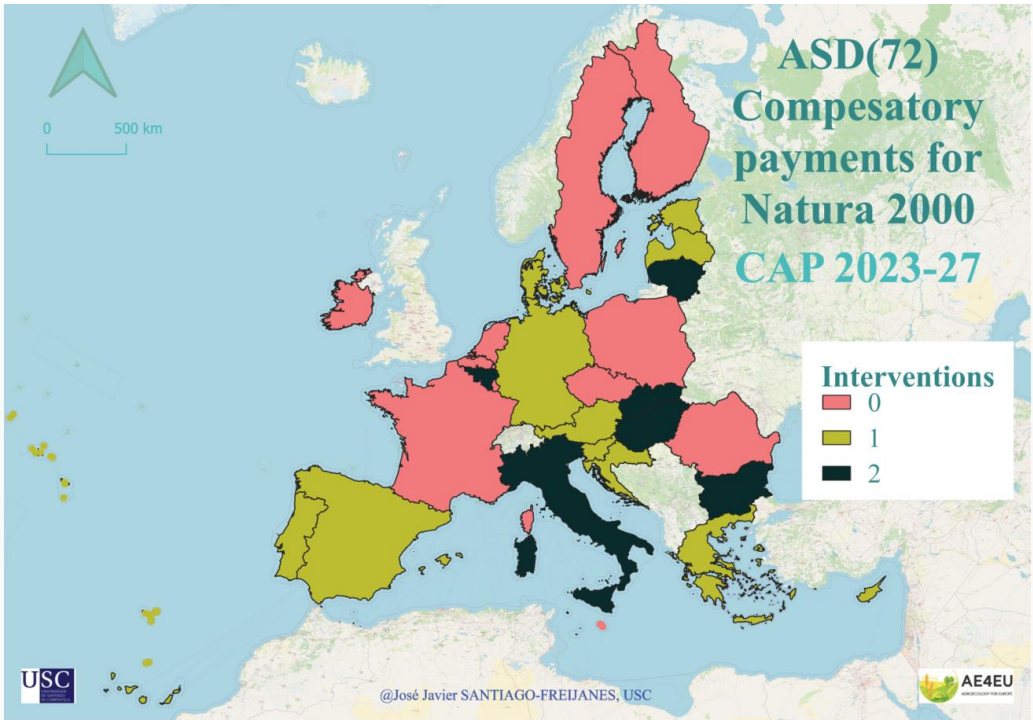
The below figure shows the amount of areas with interventions allocation to natural areas or areas with specific constraints. Most of the countries implement this type of intervention but there are some like Ireland, Germany, The Nehterlands, Czech Republic, Hungary, Estonia, Latvia and Sweden that do not implement it.



Number of rural development interventions promotion of natural or other area-specific constratints in the CAP 2023-2027

Habitats protection interventions: Areas-specific disadvantages resulting form certain mandatory requirements

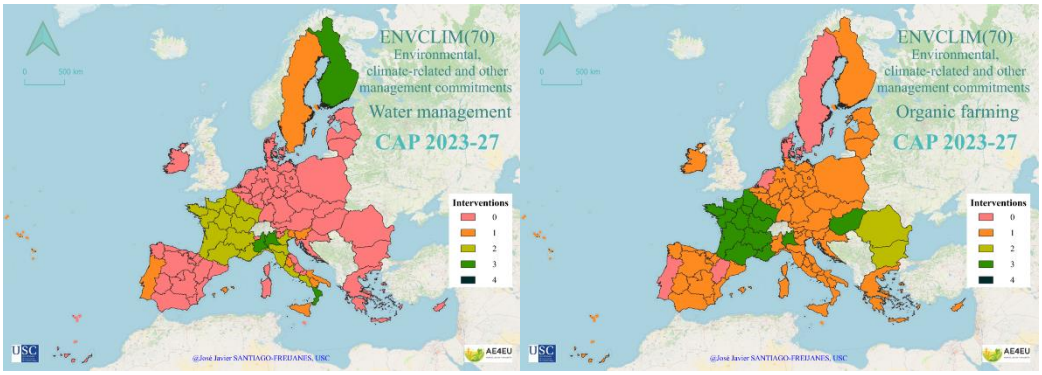
The below figure shows the number or areas promoting compensatory payments for Natura 2000, that are mostly implemented in central and the South of Europe.



Number of rural development interventions promoting areas-specific disadvantages in the CAP 2023-2027

Other agroecosystem interventions

The below figure shows some agroecological practices that are promoted through global measures like for example the improvement of the efficiency of water management enhancing water quality and availability that improves the agricultural lands ecosystem services provision. Wate management is usually linked to the south and north of Europe. Other interventions like the promotion of organic farming can be linked to any of the agroecology practices. Finally animal welfare is usually associated with the promotion of animal welfare in stables and not linked to graing.as a practice in Europe.



Number of rural development interventions promoting water management, organic farming and animal welfare in the CAP 2023-2027

Recommendations for CAP

The current open rural development interventions associated with the CAP 2023-2027 are mostly linked to agroecological practices associated with crop rotation, crop diversification, livestock diversification and soil protection, enhancement and restoration.

From those livestock rotation is not presented as part of the rural development interventions.

There is a lack of promotion of the connectivity among different types of lands by using livestock or forest residues that are incipiently promoted in France and that are needed to fulfil the agroecological principles.

Images

Chestnuts in agroforestry image by José Javier Santiago Freijanes in Galicia

All maps figures by José Javier Santiago-Freijanes

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#13 Agroecology and social rural development programme interventions

AE4EU

AGROECOLOGY FOR EUROPE

Agroecology and the social rural development programme interventions

Key recommendations for the post 2027 Common Agricultural Policy 1

Authors: María Rosa Mosquera-Losada, Nuria Ferreiro-Domínguez, Francisco Javier Rodríguez-Rigueiro, Antonio Rigueiro-Rodríguez, José Javier Santiago-Freijanes

December 2023

Forward

Social aspects have been promoted by the successive CAPs. However, they were mostly horizontally implemented and no so noticed by the end-users as a whole and as it is recognized by different EU actors. The Social rural development interventions associated with the food system agroecological is based on three pillars: (i) Horizontal knowledge sharing among different types of stakeholders to reach and objective (ii) Collaboration and cooperation among peers and with the same type of stakeholders to optimize the use of the resources and (iii) the use of short and diversified value chains. The aim of this policy brief is to understand how the social interventions of the CAP 2023-2027 can be associated with the social agroecology pillars and definitions.

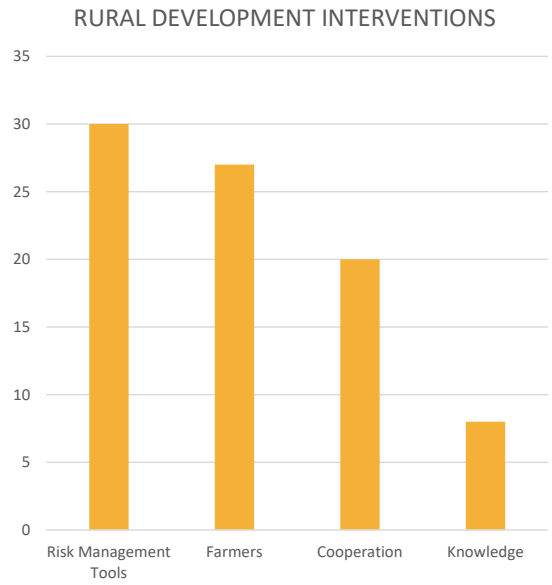
Social rural development interventions

The social rural development deals with some of the social CAP objectives associated with the Rural Areas development by ensuring farmer renewal and the development of rural business models, the food and health sovereignty through the risk management tools and cooperation. Moreover, the social rural development has a specific intervention linked to the knowledge exchange and dissemination information as shown in below table. The social rural development programme has around 253 interventions. However, the types of interventions of rural development are not directly linked to the reconnection of consumers and producers through the development of alternative food networks and even less with the building of new global food system based on participation, localness, fairness and justice.

Structure of the social Rural Development interventions

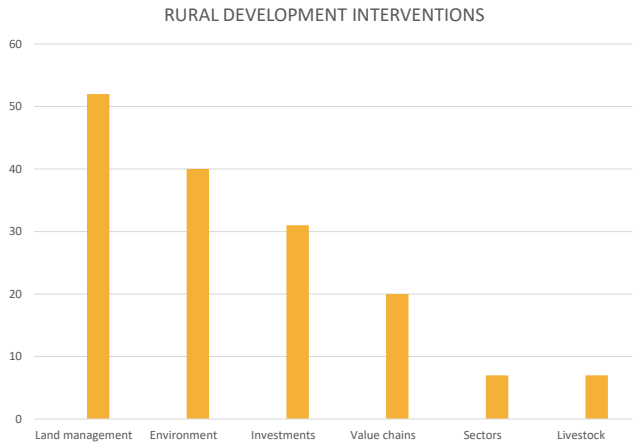
	RURAL DEVELOPMENT INTERVENTIONS
INVESTMENTS	Investments, including investments in irrigation
RURAL EMPLOYMENT	Setting-up young farmers and new farmers and rural business start-up
TOOLS	Risk management tools
KNOWLEDGE EXCHANGE	Cooperation
	Knowledge exchange and dissemination of the information

The connection between the social rural development interventions and the agroecology pillars are: The social rural development interventions linked to the setting-up of young farmers and new farmers and rural business start-ups can be linked to agroecological practices such as short value chains, the cooperation can be associated with the collaboration among peers and the knowledge exchange and dissemination of the information can related to the horizontal knowledge sharing among different types of stakeholders to reach and objective. The below figure shows the number of rural development interventions associated with the social agroecology perspective that are higher for the establishment of risk management tools, farmers interactions, cooperation and knowledge sharing.



Rural Development social number of interventions excepting investments

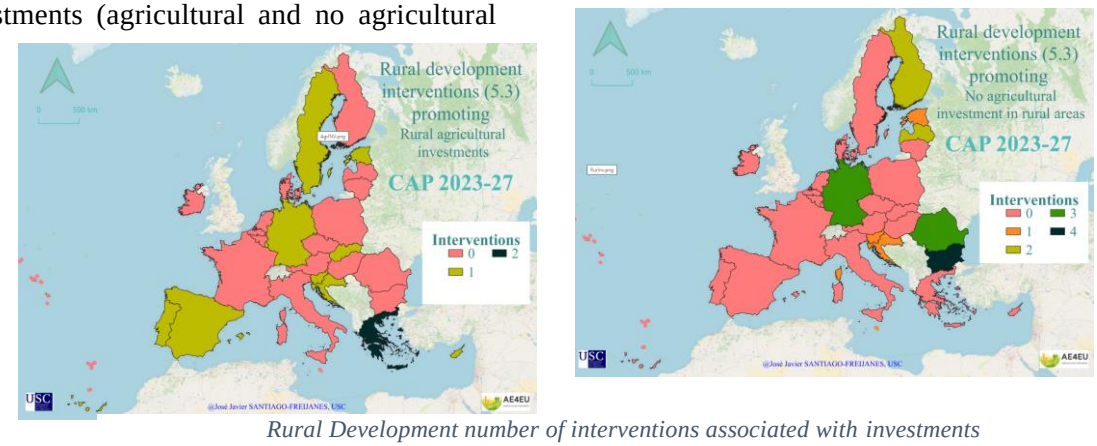
The global analysis of the type of social rural development interventions can be seen in the Figure 21. From this, it can be seen that the rural development interventions are associated with land management, environment, investments, value chains sectors and livestock in this order.



Rural Development social number of interventions associated with different topics

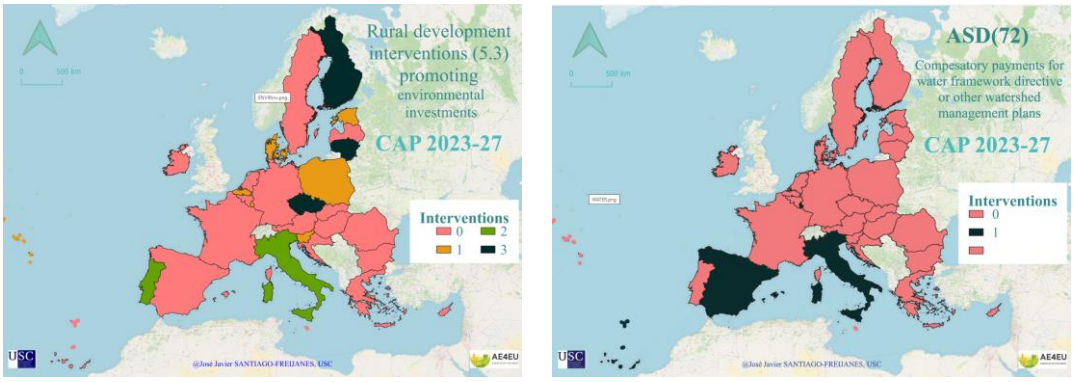
Rural Development social interventions: Investments including investments in irrigation

The below figure shows the number of interventions linked to investments that are associated with agricultural or non agricultural in rural areas. The number of interventions are restricted to few countries, being both types of investments (agricultural and no agricultural areas) only promoted in Germany. The proportion of investments associated with environment are close to 65% being the rest linked to rural development not directly involving agriculture.



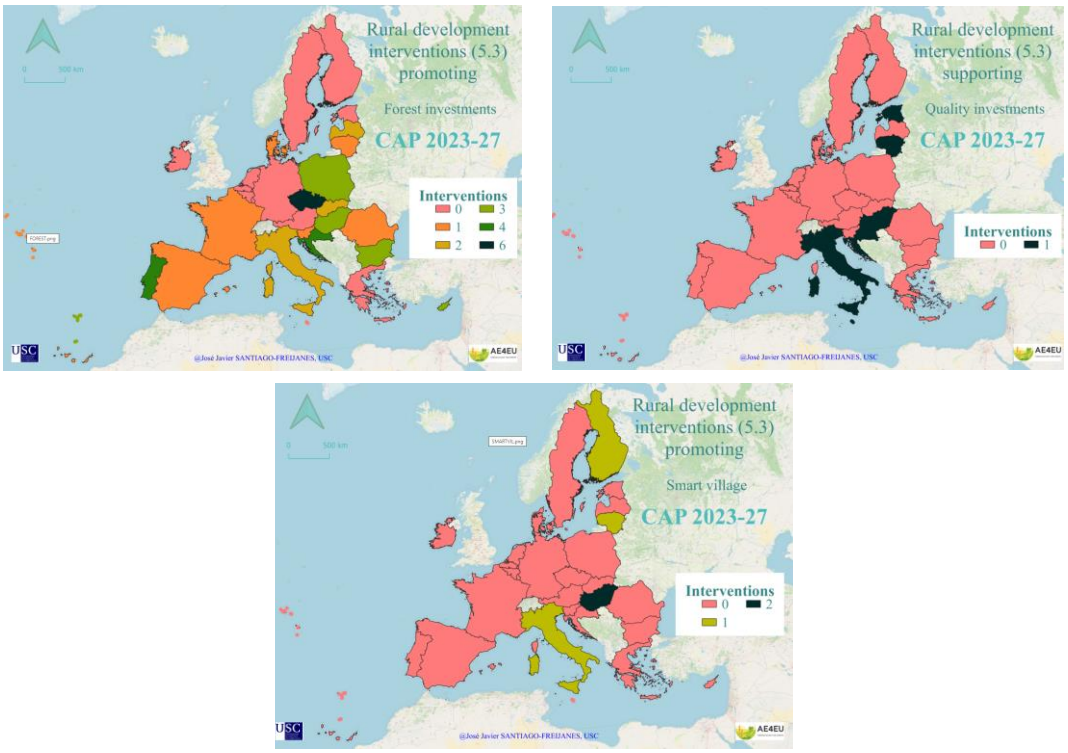
Rural Development number of interventions associated with investments

The investments associated with the watersheds are mainly placed in the Mediterranean area, while those associated with environment are linked to a set of high biodiverse countries as shown by the below figure. Water efficiency improvement represents the 7% of the total set of social interventions of the Rural Development Programmes in the CAP, being the 50% linked to the environment investments, and less than 10% are associated with fertilization and livestock residues management.



Rural Development number of interventions associated with watershed and environmental investments

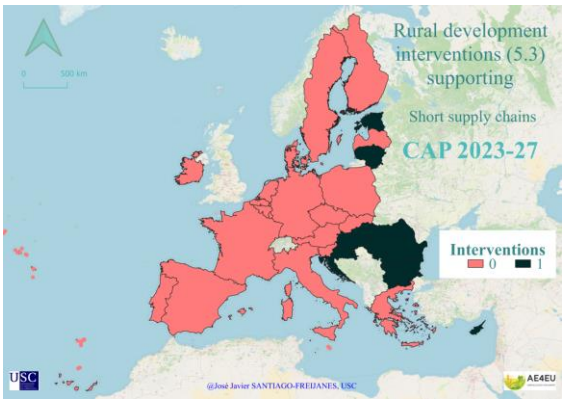
The below figure shows the most relevant types of investments associated with the rural investments (Forest), product investments (quality) and rural-urban areas promotion through the development of smart villages. With the exception of forest investments, all the relevant non agricultural investments are restricted to a very few number of countries. Around 20% of the forest and agroforestry land management investment is associated with agroforestry.



Types of investments interventions

Rural Development social interventions: Young farmers and new farmers and rural business start-up

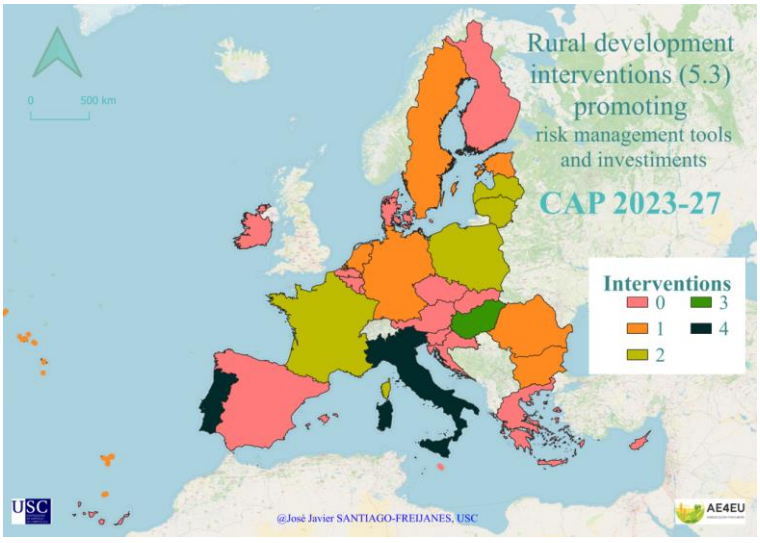
The development of a social measure linked to young farmers, also as part of the direct payments is key for the replacement of farmers in an aged European Union. Business start-ups are mostly associated with the development of new products, and bioeconomy which are highly relevant, but they are not interventions linked to short value chains or participatory approaches linked to the food system. Aspects like product diversification that ensures food security are not directly promoted. The value chain interventions share linked to the young farmers and new farmers and rural business start ups are equaly distributed in value chain, food quality, bioeconomy, being less promoted the circular economy. The below figure shows the interventions associated with the rural development programme that directly supports short value chains, which is restricted to very few eastern countries.



Rural development interventions supporting short value chains in the CAP 2023-2027

Rural Development social interventions: Risk Management tools

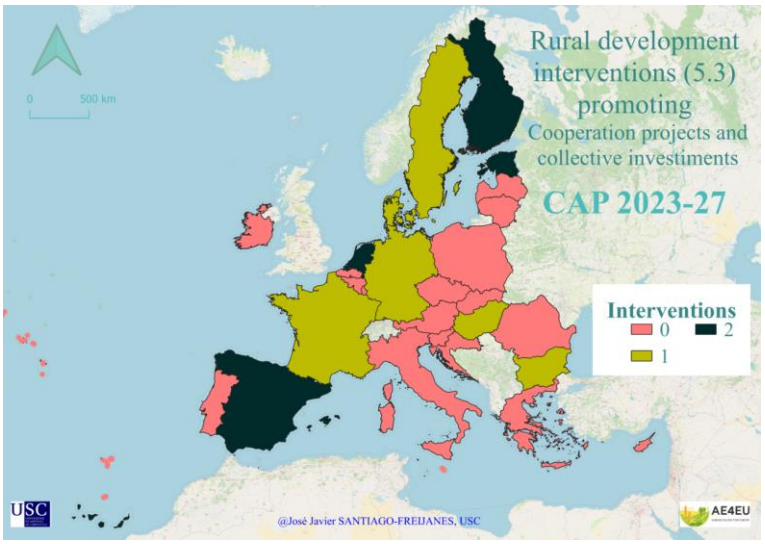
The below figure shows the map of the rural development interventions promoting risk management tools. This is the most popular intervention of the social ones that is well developed in Italy, but also in France and Portugal or Germany and Poland. However, it is not implemented in large countries like Spain.



Rural development interventions supporting risk managment tools in the CAP 2023-2027

Rural Development social interventions: Cooperation

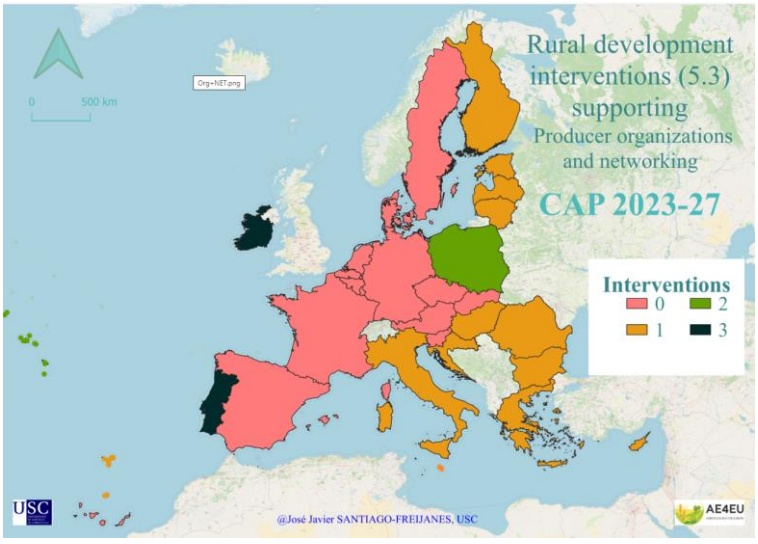
The cooperation projects and collective investments are implemented in large countries like Spain, France, Germany, Sweden and Findlad but not implemented in most of Europe as shown in the below Figure.



Rural development interventions supporting cooperation projects and collective investments in the CAP 2023-2027

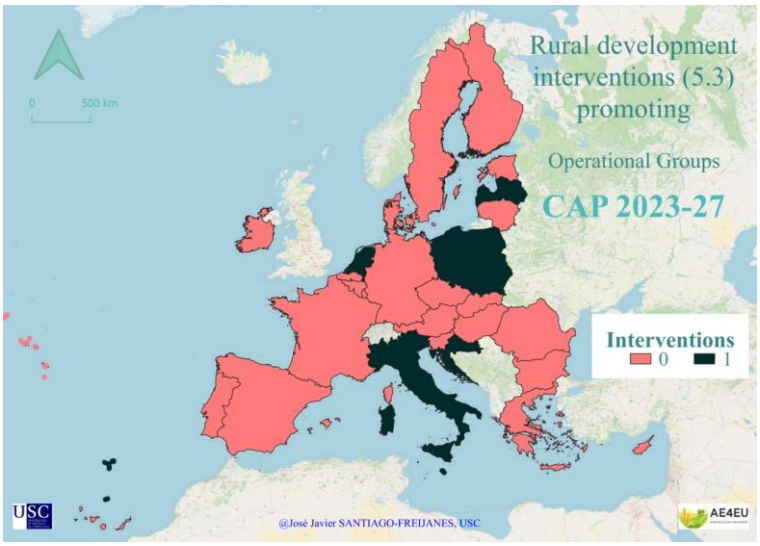
Rural Development social interventions : Knowledge exchange and dissemination of information

The producer organizations and networking interventions can be seen in the below figure. This type of information is relatively important in the Mediterranean countries but also in the northern countries suc as Poland, Finland, Estonia, Lithuania and Latvia.



Rural development interventions supporting producer organizations and networking by the CAP 2023-2027

The promotion of operational groups by the intervention of the CAP 2023-2027 can be seen in the belw figure, that shows a low number of countries implementing the operational groups. This is probably due to the fact that there is still some operational groups implementation in the previous CAP 2014-2020.



Rural development interventions supporting operational groups by the CAP 2023-2027

Recommendations for CAP

Food system based Rural Development interventions

The current open social rural development interventions associated with the CAP 2023-2027 are somehow promoting social agroecological aspects linked to the knowledge transfer and fostering interactions among different types of stakeholders and promoting short value chains. However, this is limited a short number of countries.

Good practices should be taken into account and used as a promotion of social rural development interventions in other countries.

Images

Chestnuts in agroforestry image by José Javier Santiago Freijanes in Galicia

All maps figures by José Javier Santiago-Freijanes

Authors

Mosquera-Losada MR, University Santiago Compostela.

Ferreiro-Domínguez N, University Santiago Compostela.

Alvarez-Lopez V, University Santiago Compostela.

Rodriguez-Rigueiro JJ, University Santiago Compostela.

Franco-Grandas T, University Santiago Compostela.

Santiago-Freijanes JJ, University Santiago Compostela.

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List of Recommendations associated with the CAP (Policy briefs 9-13 of AE4EU and 1 to five associated with the CAP series)

The following recommendations for future CAP taking into account the initial implementation of the CAP 2023-2027 as described in the Deliverable 5.6 are:

Recommendation 1: Agroecology agroecosystem-based definition: Agroecology agroecosystem based is defined as the Agroecology agroecosystem level definition is the agricultural spatial and temporal biodiversity preservation, enhancement, use and integration at multiple scales to increase resources use efficiency while improving ecosystem services delivery ».

Recommendation 2: Crop rotation: The promotion of crop rotation should be enhanced by the CAP at multiple temporary scales including the short, intermediate and long term (agroforestry) rotations.

Recommendation 3: Livestock rotation: The promotion of crop rotation should be enhanced by the CAP at multiple temporary and spatial scales including the short, intermediate (trastermitance) and long term (trashumance) rotations as a form to optimize the use of the resources and increase land connectivity and therefore enhancing biodiversity.

Recommendation 4: Crop diversification: The promotion of crop diversification should be enhanced by the CAP at multiple scales including intraspecific, the inter-specific with herbaceous-herbaceous and herbaceous-woody perennials combinations (agroforestry).

Recommendation 5: Livestock diversification: The promotion of livestock diversification should be enhanced by the CAP at multiple scales including intraspecific, the inter-specific with to protect the existing livestock biodiversity while promoting farming resilience.

Recommendation 6: Soil sustainable management: The sustainable soil production is essentially obtained through the adequate inputs of organic matter to overcome the intensive farming system soil decapitalization at medium and long term. Crop rotation, crop diversification, livestock rotation and livestock diversification play an important role in obtaining these organic matter inputs without external ammendments. The use of forest residues as a way to increase soil organic matter is also an excellent landscape nutrient cycling connection that improves sustainable soil fertility promotion that was traditionally used in Europe. Due to the huge soil degradation and the excess of mineral nutrient applied in European soils, the lack of chemicals use and the nutrient accountability is seen as essential.

Recommendation 7. Food system management : Agroecology social definition is the dynamic social construction within and among actors that fosters knowledge and activities exchange processes and continuous learning among different stakeholders: producers, processors, retailers, advisors, researcher and consumers aiming at implementing the agroecology main principles or elements. The social movement associated with the agroecological elements should be fostered based on the horizontal knowledge sharing among peers and stakeholders, collaboration and cooperation among peers and stakeholders and the promotion of short and diversified value chains.

Recommendation 8: Standards for good agricultural and environmental condition of land (GAEC): The current state of degradation of European ecosystems makes highly relevant all the GAEC proposals. However, the ones associated with permanent grasslands should be more ambitious and promote the expansion of the extent of this land whenever abandon land on marginal areas exist

through extensive livestock farming systems in some Mediterranean areas. Adequate prescribed burning practices ensures shrublands health if carried out in small areas and combined with grazing. No-tillage, minimum tillage and avoiding bare soils are seen as a great measure to preserve the carbon but the introduction of woody perennials to enhance soil carbon stocks is needed in some degraded soils. More proactive GAEC initiatives such as buffer strips along water courses, crop rotation and the inclusion of non-productive areas or features in agricultral areas are more suitable for the current EU degraded soils and ecosystems.

Recommendation 9: Statutory management requirement (SMR): The current state of degradation of European ecosystems, the needs of protecting health and ethically promote animal welfare makes highly relevant all the SMR proposals. The links of the use of biodiversity to reduce the needs of fertilizers (water protection), and preserve habitats (for birds, flora and fauna) is not clearly shown. Therefore a lack of agroecological, biodiversity nature-based solutions are not linked to the SMR as the first step to reduce the SMR1 to 4 aims. There is a lack of connection of the biodiversity potential and their respective ecological functions with the food safety and plant protection. SMR 1 to 8 should be clearly linked to crop rotation, crop diversirication, soil preservation and adequate livestock grazing to reduce the degradation state of the European ecosytems from the very beginning in the CAP besides what is shown and enlarged in the eco-schemes or rural development methods. The SMR 9 to 11 should promote grazing as a way to use and promote biodiversity at various levles and recognize the role extensive grazing systems with a per se brand of fulfilment of the animal welfare requisites that are linked to the plot, farm and ladnscape agroecological practices.

Recommendation 10: Ecoschemes: The ecoschemes list proposed by the European Commission are mostly linked to to the agroecological practices associated with crop rotation, crop diversification, livestock rotation, livestock diversification and soil protection, enhancement and restoration. From those livestock diversification is not presented as part of the ecoschemes. Moreover, there are several practices that may involve all agroecological biodiversity-based practices, but they are not detailed enough. The involvement of forest lands as suppliers of fertility to agronomic land, the use of livestock as a way to increase the nutrient cycling and above all of them to improve soil health should be better detailed.

Recommendation 11: Agroecosystem based Rural Development interventions: The current open rural development interventions associated with the CAP 2023-2027 are mostly linked to to the agroecological practices associated with crop rotation, crop diversification, livestock diversification and soil protection, enhancement and restoration. From those livestock rotation is not presented as part of the rural development interventions. There is a lack of promotion of the connectivity among different types of lands by using livestock or forest residues that are incipiently promoted in France and that are needed to fulfil the agroecological principles.

Recommendation 12: Food system based Rural Development interventions: The current open social rural development interventions associated with the CAP 2023-2027 are somehow promoting social agroecological aspects linked to the knowledge transfer and fostering interactions among different types of stakehodlers and promoting short value chains. However, this is limited a short number of countries.

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